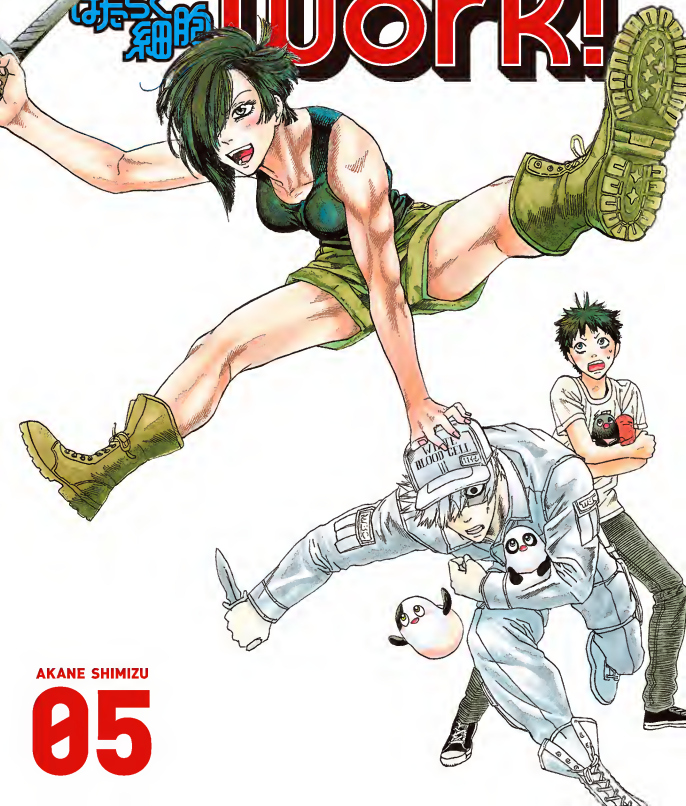


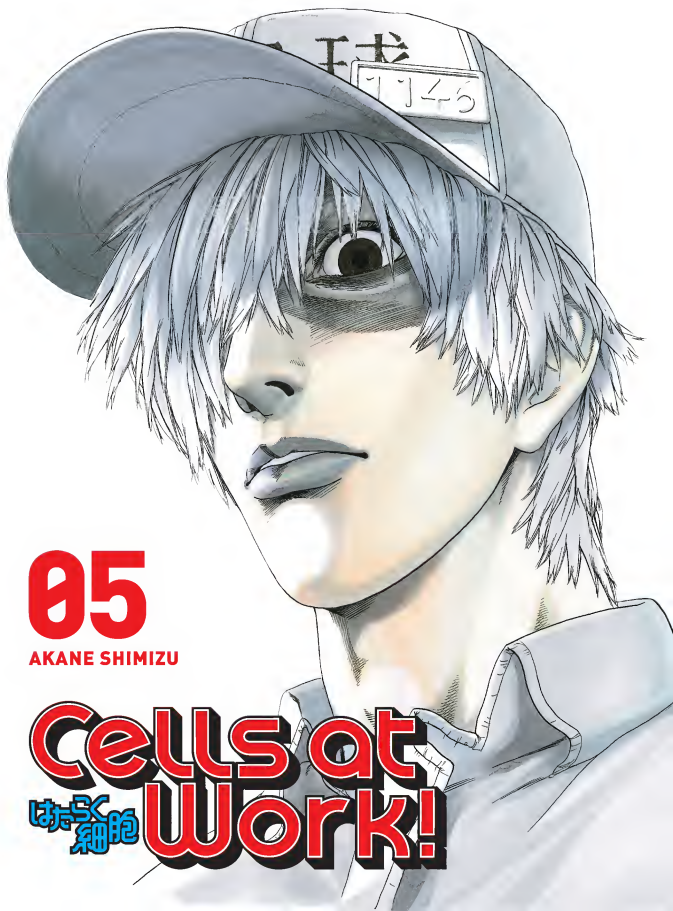
Cells at Work!

はたらく細胞



AKANE SHIMIZU

05



05

AKANE SHIMIZU

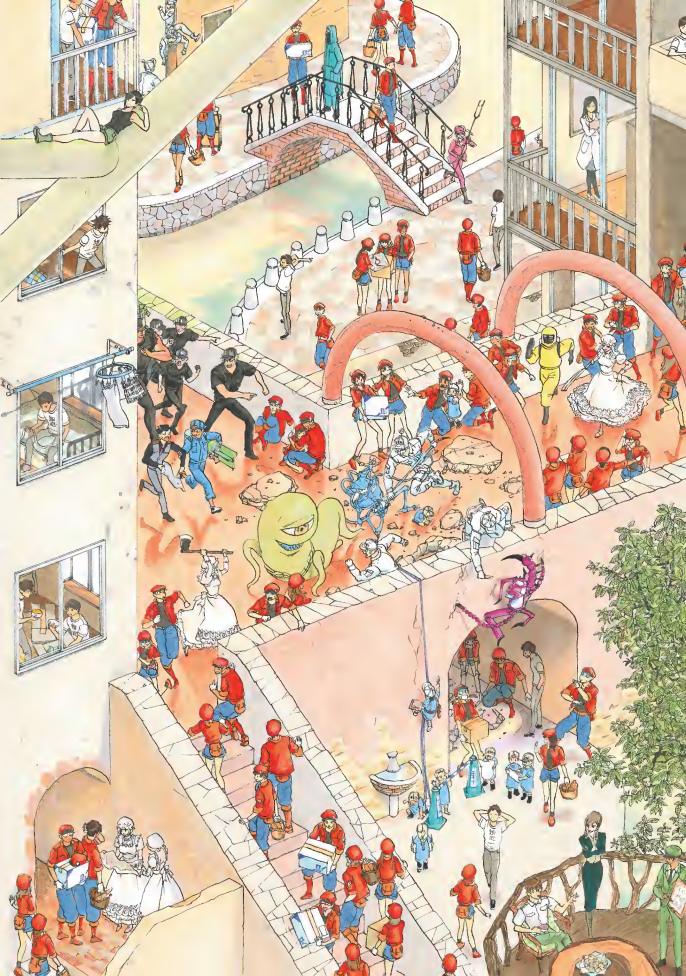
Cells at
はたらく細胞 Work!

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Chapter 25	Cancer Cell II (Part II)	175







**WE'VE GOT
A SITUATION
NEAR THE
PHARYNX!**



AUGH!

**VIRUS-
INFECTED
CELLS!**

**IMMUNE
CELLS ARE
TO DEPLOY
IMMEDIATELY
TO THE
SITE!**

CHAPTER 20: H. PYLORI

AND IT'S
THE SAME
STORY
ALL OVER
AGAIN...

...BEAT
ALL THE
INFECTED
BAD
GUYS...

THE
IMMUNE CELLS
RUSH TO THE
SCENE...

SO TODAY,
LIKE EVERY
OTHER
DAY...

...AND
RESTORE
PEACE
TO THE
TOWN...

HEY! I TOLD
YOU NOT TO
PRATERNIZE!!
IGNORE HIM!!

HEY, I
KNOW
THAT
CELL...



THEY'RE JUST
KILLERS, BUT
THEY ACT LIKE
SUPERHEROES!

WHOOOSH

PTT

OUT OF
SERVICE

WHO
DO THOSE
IMMUNE
CELLS THINK
THEY ARE,
ANYWAY?

JUST
ONE
TIME!



SHOOT...
JUST ONCE,
I'D LIKE
TO HELP
SOMEONE
SO THEY'D
BE ALL:

THANK
YOU
FOR
SAVING
ME!

WSH
H
TTT

AND WHEN WE GET
ATTACKED BY VIRUSES, THEY
SCOLD US FOR NOT DEFENDING
OURSELVES PROPERLY AND
NOT BEING AWARE OF THE
DANGERS.

I'M GETTING
ANGRY JUST
REMEMBERING.

BUSTLE

ONLY IF
I WERE
STRONGER

SIGH...



BUSTLE

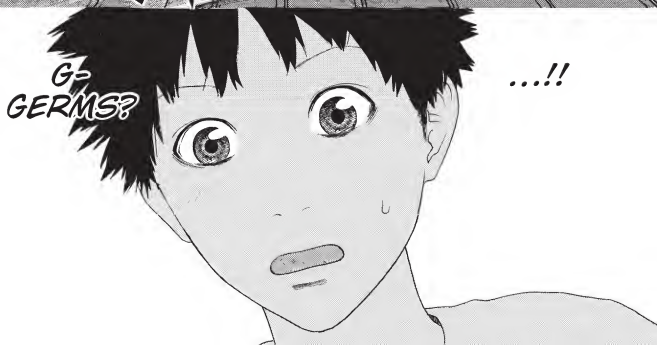
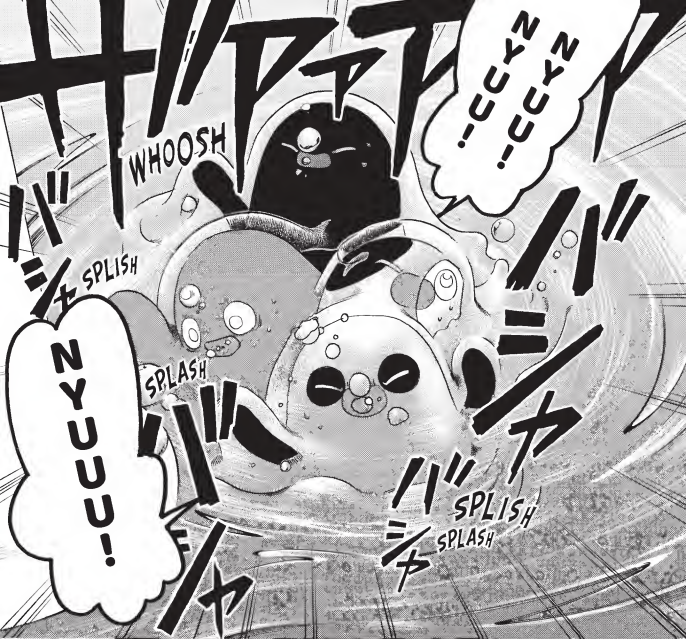
CELL

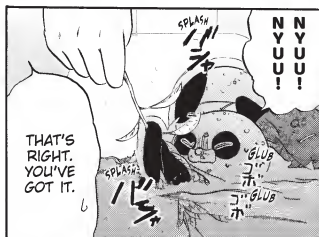
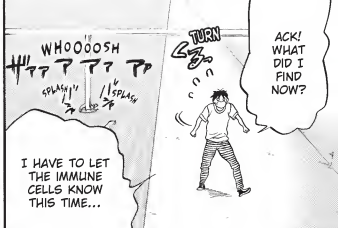
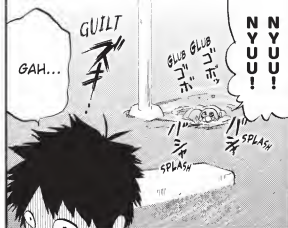
...HUH?

WHOOOSH

SHEESH!
ORDINARY
CELLS LIKE US
HAVE LIVES
AND FEELINGS,
TOO!

BUT
THEY
DON'T
CARE!





NYUUUUU--





...AND FELT A LITTLE SICK, SO I SAT DOWN FOR A BIT.☆

カッ
カバー

N-N-N-N-
NOTHING!!
I JUST
ATE TOO
MUCH...

OH,
I SEE.
FEEL
BETTER!



I'M NOT GONNA TELL ANYONE ABOUT YOU, SO JUST MAKE IT BACK—

I DON'T WANT TO GET IN TROUBLE!

NYUU!

スプラッシュ



GO BACK WHERE YOU CAME FROM, AND STAY OUT OF TROUBLE!

THAT WAS CLOSE... IF THOSE GUYS CATCH YOU, THEY'LL KILL YOU.

NYU!



STOP FOLLOWING ME!

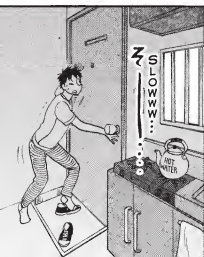
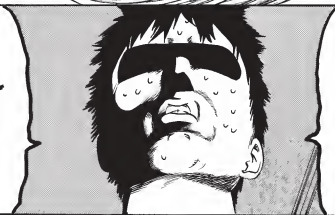
HEY. OH!



TEP TEP TEP TEP TEP

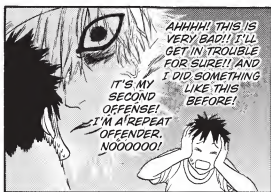


...I BROUGHT
THEM HOME
WITH ME...



DING
DONG

THEY
COULD
EVEN
KILL ME,
TOO...



AHHHH! THIS IS
VERY BAD!! I'LL
GET IN TROUBLE
FOR SURE!! AND
I DID SOMETHING
LIKE THIS
BEFORE!

IT'S MY
SECOND
OFFENSE!
I'M A REPEAT
OFFENDER.
NOOOOOO!



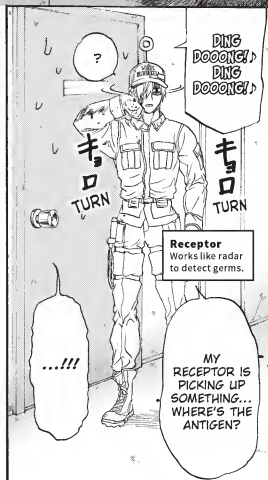
White Blood Cell (Neutrophil)

His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.



IF HE
FINDS YOU,
YOU'RE
DEAD!!!

YOU DUMMY!
SHHHH
SHHHHHHH!
QUIET!!



PING
DOOONG! PING
DOOONG!

キ、ロ
TURN

キ、ロ
TURN

Receptor
Works like radar
to detect germs.

...!!!

MY
RECEPTOR IS
PICKING UP
SOMETHING...
WHERE'S THE
ANTIGEN?

HE'S BEING HELD
BEHIND THE DOOR BY
THE ANTIGEN...
AND HE CAN'T CALL
FOR HELP, SO HE MADE
THAT NOISE OUT OF
DESPERATION...?!

OH!

KNOCK
KNOCK
???

WAS HE
TALKING IN
HIS SLEEP
OR SOME-
THING?

...NO
REPLY?

PARDON
ME, BUT IS
EVERYTHING
ALL RIGHT?

HEY
THERE,
CELL
BOY
...?

CALL
FOR HELP
AND I'LL
KILL YOU!

WAIT...
MAYBE—

WHATEVER.
I HAVE TO
FIND THE
ANTIGEN...

I'M GOING
TO RETURN
THESE
WHERE
I FOUND
THEM...

IT GOT
QUIET...
DID HE GO?
GOOD.

SMASH

THERE'S
AN
ANTIGEN
NEARBY...

HEY CELL
BOY, ARE
YOU ALL
RIGHT?!

SH

I UNDERSTAND HOW YOU FEEL...

BUT I CAN'T STAND BY AND WATCH AS GERMS MULTIPLY INSIDE THE BODY.

AH!

WHAT, ARE YOU HUNGRY? I DON'T HAVE ANYTHING FOR YOU.

NYUU! NYUU!♡

TEP

HMM ...?

I DON'T HAVE ANYTHING, SEE!

CELL BOY...

NYUU! NYUU!♡

THEY WARMED UP TO ME AFTER I SAVED THEM... AND I COULDN'T JUST LEAVE THEM WHEN I THOUGHT ABOUT THEM BEING KILLED...

S... SO THAT'S WHAT HAPPENED.

FALTER

FALTER

...I SEE.

IN SOME CASES, THEY CAN DESTROY RED BLOOD CELLS IN A PROCESS CALLED HEMOLYSIS, AND ROB US OF OUR NUTRIENTS. ...DO YOU UNDERSTAND?



ONCE THEY MULTIPLY, GERMS RELEASE TOXINS AND HARM THE CELLS INSIDE THE BODY.

NYUUUU

IT WOULD BE CRUEL TO KILL THEM IN FRONT OF HIM...

NYUU? NYUU NYUU? NYUU NYUU NYUU ?!

STEP

THANK YOU FOR HELPING TO APPREHEND THE ANTIGENS.



HM?

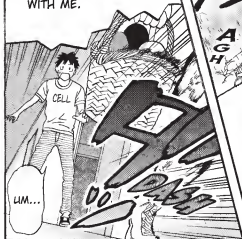
HEY 1140,
ARE YOU
THERE?



CELL BOY,
I'M TAKING
THESE
GERMS
WITH ME.

GOT IT!
I'LL BE
RIGHT
THERE.

THIS IS 4989.
A GERM IN THE
STOMACH IS
PUTTING UP A
TOUGH FIGHT!



UM...

CAN
YOU GET
THROUGH
THE
ESOPHAGUS
AND
HELP?!



...CAN'T
PROTECT
ANYTHING...
AND IT'S OUR
LOT TO DIE A
MEANINGLESS
DEATH
SOMEDAY...

REGULAR
CELLS
LIKE ME...

R-RIGHT...
THAT'S
HIS JOB...

IT'S THE
IMMUNE
CELLS' JOB
TO PROTECT
THE REST
OF US...

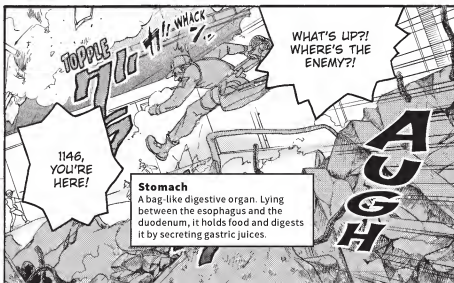


7" 7" ..
SQUEEZE

BUT
THOSE
GUYS...



OVER
THERE...
BEYOND
THE
STOMACH
LINING!!



1146,
YOU'RE
HERE!

WHAT'S UP?!
WHERE'S THE
ENEMY?!

Stomach

A bag-like digestive organ. Lying between the esophagus and the duodenum, it holds food and digests it by secreting gastric juices.

THAT'S
RIGHT!
ABANDON
HOPE!!

HA
HA
HA
HA
HA!

PYLO
PYLO
PYLO
PYLO

SPLOO SH

WE H. PYLORI
HAVE HARDY
BODIES THAT
ALLOW US TO
OPERATE INSIDE
GASTRIC ACID!
UNLIKE YOU
WEAKLINGS!!

THERE'S
NOTHING
YOU CELLS
CAN DO TO
STOP ME!

H. Pylori

Helicobacter pylori. Resistant to gastric acid, they cause inflammation and ulcers, and on occasion, stomach cancer. Bacteria harmful to the human body.

THIS
ISN'T
GOOD...

H.
PYLORI...

AAUGH

RUMBLE

ト
ト
ト





THIS
BODY IS
OURS
NOW!

IT'S
MADE
OF
ACID-
RESIST-
ANT
ENAMEL
!!

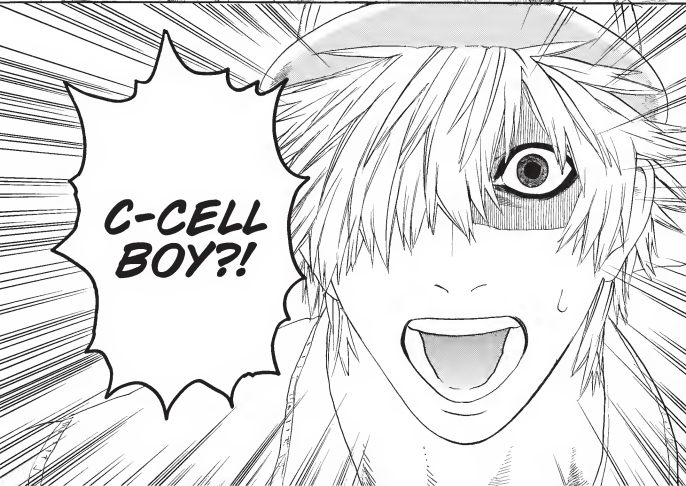
AT
LEAST
WEAR
THIS!

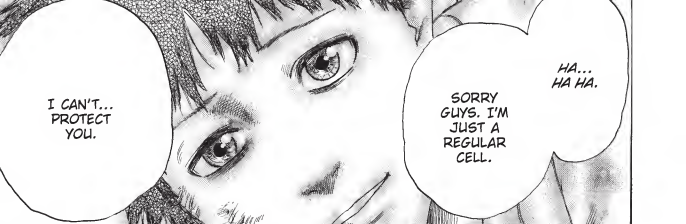
CRASH

IT'S
BREAK-
ING
DOWN!

OH NO!
THE
STOMACH
LINING...



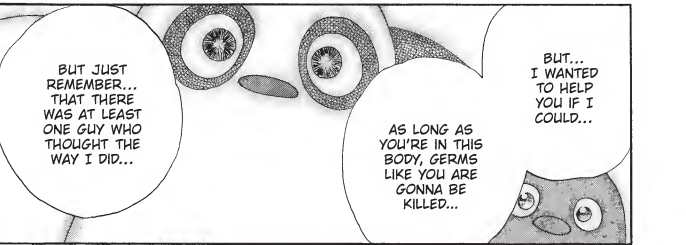




I CAN'T...
PROTECT
YOU.

HA...
HA HA.

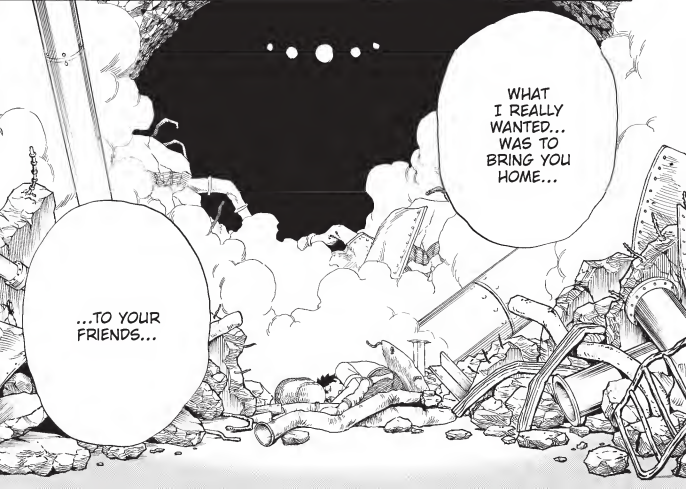
SORRY
GUYS. I'M
JUST A
REGULAR
CELL.



BUT JUST
REMEMBER...
THAT THERE
WAS AT LEAST
ONE GUY WHO
THOUGHT THE
WAY I DID...

BUT...
I WANTED
TO HELP
YOU IF I
COULD...

AS LONG AS
YOU'RE IN THIS
BODY, GERMS
LIKE YOU ARE
GONNA BE
KILLED...



...TO YOUR
FRIENDS...

WHAT
I REALLY
WANTED...
WAS TO
BRING YOU
HOME...



ARE
YOU ALL
RIGHT?!

**A CELL
SAVING A
GERM.**

HA
HA HA...
NOW ISN'T
THAT
SOMETHING.



HUH...
YOU...

I COULD
SWEAR I'VE
SEEN YOU
SOMEWHERE
BEFORE...

I'LL
ANNIHILATE
YOU ALL.

FWIP!!

NO
MATTER.

TAKE
THIS!

RU

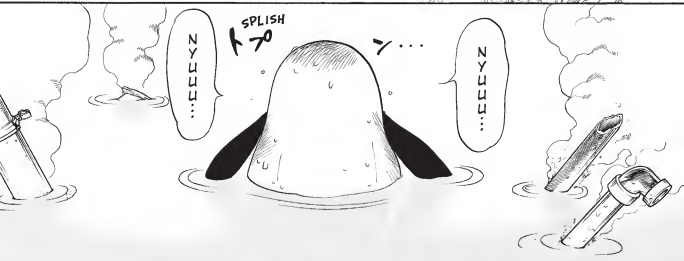
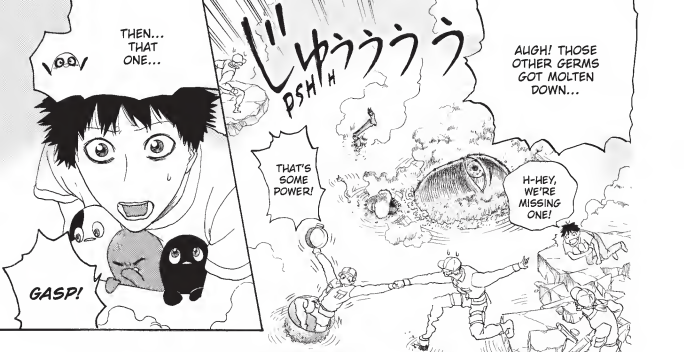
SH

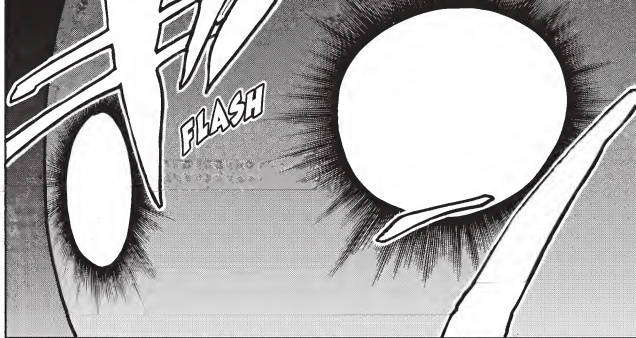
!!

A FLOOD
OF
GASTRIC
ACID!!

OH
NO!









KIR

NYNNNN!

KZZZZZ?

THAT
GERM'S
ATTACK
WORKED
ON THE
PYLORI?!

WHOA!

WH-
WHAT
HAPPENED
?!



PYLO
GO

GUHHH...
THAT'S
IMPOSSIBLE
...

GASP!

A-ARE
YOU...

GO
GO

PYLO

HOW DID
YOU HURT
ME...?

PYLO
GO
GO

NYUUUUU!!



A LACTIC
ACID
BACTERIUM
?!

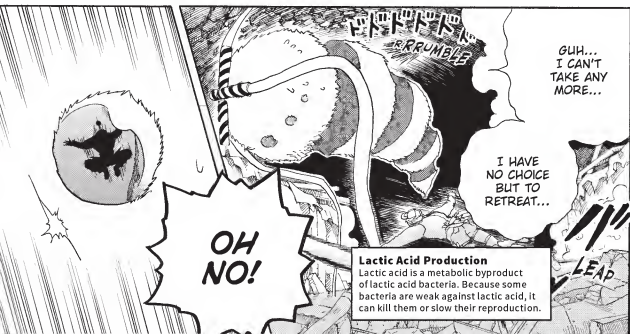
Lactic Acid Bacteria

A name not for a specific bacterial species, but a blanket term for bacteria that produce lactic acid in the course of breaking down sugars to live. The "nyuu" sound it makes in this comic comes from the Japanese term for lactic acid bacteria, "nyuusankin."

GAAAAH!
NO MORE!



NYU NYU
NYU NYU
NYU NYU
NYU NYU
NYU NYU
NYU NYU
NYU NYU
NYU NYU
NYU NYU
NYU NYU



GUH...
I CAN'T
TAKE ANY
MORE...

I HAVE
NO CHOICE
BUT TO
RETREAT...

OH
NO!

Lactic Acid Production

Lactic acid is a metabolic byproduct of lactic acid bacteria. Because some bacteria are weak against lactic acid, it can kill them or slow their reproduction.

...FROM
THAT
SEA OF
ACID.

YOU
FINALLY
CAME
OUT...

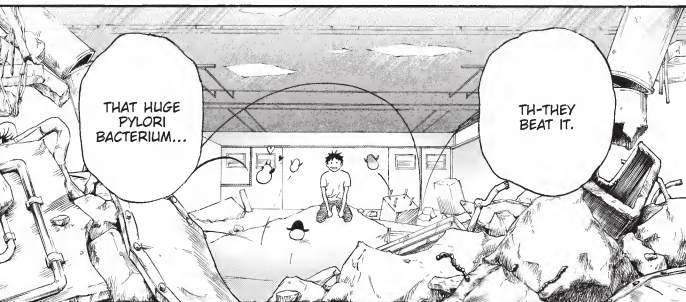
NYUU!

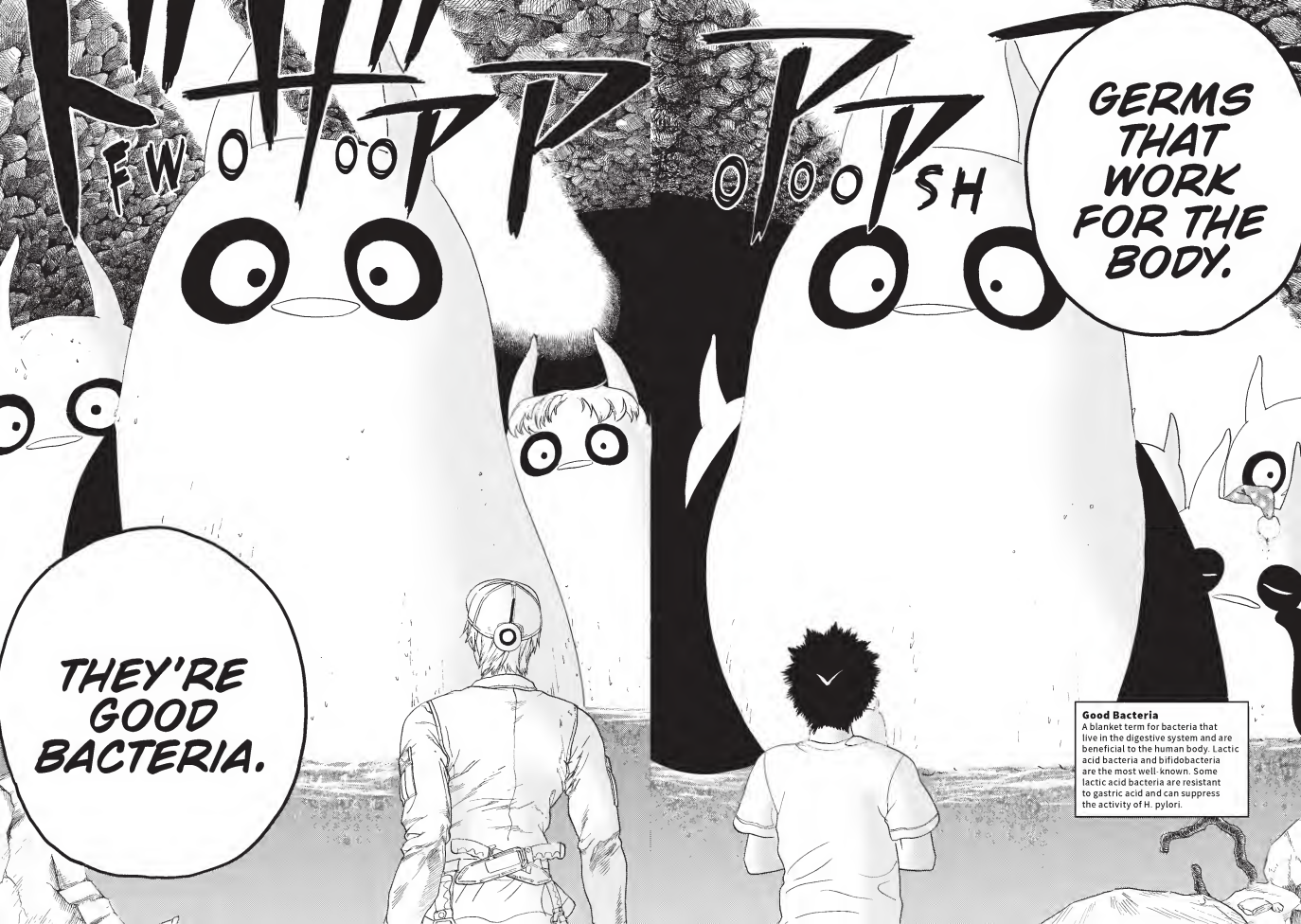
OH SHOOT,
OH SHOOT,
OH—

DIE, YOU
"PYLO"-ING
SCUM!

SLASH

PYLORIII!!





THEY'RE
GOOD
BACTERIA.

GERMS
THAT
WORK
FOR THE
BODY.

Good Bacteria

A blanket term for bacteria that live in the digestive system and are beneficial to the human body. Lactic acid bacteria and bifidobacteria are the most well-known. Some lactic acid bacteria are resistant to gastric acid and can suppress the activity of *H. pylori*.



I DIDN'T
REALIZE WHAT
THEY WERE
BECAUSE I'VE
NEVER SEEN
THEM IN THEIR
INACTIVE
FORM.

THEY MUST
HAVE COME INTO
THE BODY WITH
SOME FOOD OR
SOMETHING.

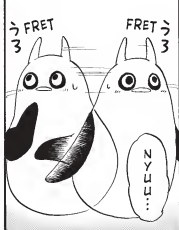
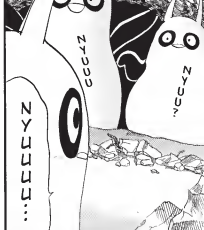
B-BUT
WHAT
ABOUT
THESE
GUYS?

OTHER
GERMS
MIGHT COME
IN THROUGH
THAT HOLE
THE PYLORI
OPENED.

...WELL,
I BETTER
GET BACK
TO PATROL
DUTY.

HUH?





BUT THERE
ARE SEVERAL
KINDS OF
LACTIC ACID
BACTERIA...

...AND THEY
WORK WITH
THEIR FRIENDS
IN VARIOUS
DIGESTIVE
ORGANS.

BY
THE WAY,
CELL BOY...
THIS MAY
OR MAY NOT
CONCERN
YOU...

HMM?

YEAH!

CELL

NYU!

NYUU!

...

WANT ME TO
SHOW YOU
AROUND?

HUH?
UH, A
LITTLE.
AH HA
HA HA.

BY
THE WAY...
HAVE YOU
GAINED SOME
WEIGHT
SINCE THE
LAST TIME
WE MET?

HEH
HEH...



...HEH...

BUT THOSE
ARE PLACES
OF CHAOS
THAT TOUCH
THE OUTSIDE
WORLD...
TEEMING WITH
BACTERIA
AND VIRUSES...
HEH HEH...

PYLOPY...

PYLOPY...

SO YOU
MEAN TO
DELIVER
THEM TO THE
DIGESTIVE
ORGANS
ALIVE...

THUD
THUD
THUD

MAY
YOU CELLS
SUFFER
AND
REGRET...

...YOUR SELF-
RIGHTEOUS
HYPOCRISY...

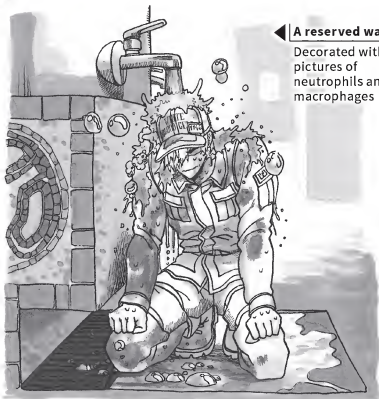
CHAPTER 20: END

STOMACH

CLOTHES

The Life and Work of White Blood Cell (Neutrophil): What He Wears

* These are depictions created just for this comic, and differ from scientific fact.



◀ A reserved wash station

Decorated with pictures of neutrophils and macrophages

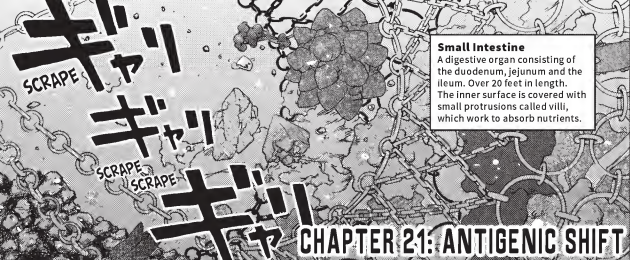
Clothes dirtied in a fight can be rinsed quickly with disinfectants and soap water. (No hot water. Cold.)



Can I have a neutrophil jacket in size L, please?

If they rip, new clothes can be retrieved at organs that work to make or store blood cells, like the red bone marrow, liver, or spleen.

Cells at
Work!
はたSC細胞



Small Intestine

A digestive organ consisting of the duodenum, jejunum and the ileum. Over 20 feet in length. The inner surface is covered with small protrusions called villi, which work to absorb nutrients.



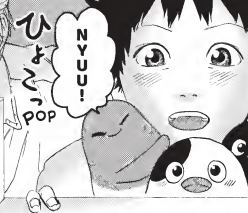
ALL RIGHT,
BRING UP THE
HAUL FROM
VILLI NUMBERS
1 THROUGH 10!

POUR

IT'S SO NICE
TO GET A WIDE
RANGE OF
NUTRIENTS!

LOTS OF
DIFFERENT
STUFF AGAIN
TODAY.

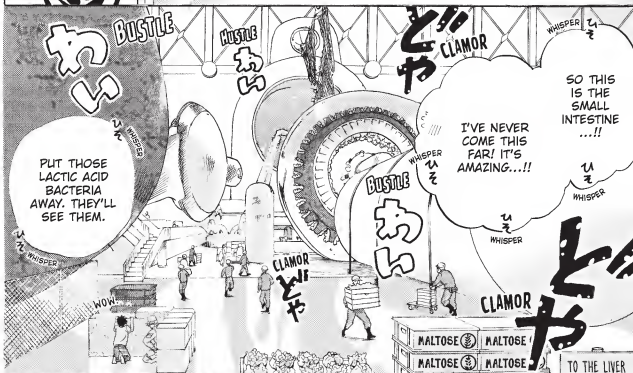
わい
BUSTLE



WHOA....!!

White Blood Cell (Neutrophil)

His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.



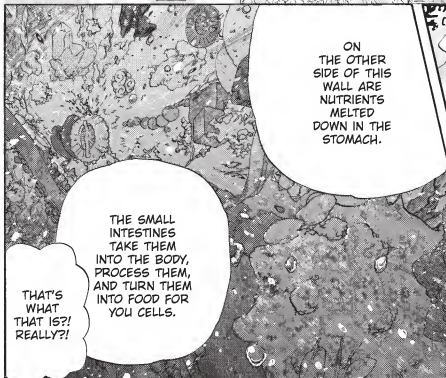
PUT THOSE
LACTIC ACID
BACTERIA
AWAY. THEY'LL
SEE THEM.

I'VE NEVER
COME THIS
FAR! IT'S
AMAZING....!!

SO THIS
IS THE
SMALL
INTESTINE
....!!

MALTOSE MALTOSE
MALTOSE MALTOSE

TO THE LIVER



ON
THE OTHER
SIDE OF THIS
WALL ARE
NUTRIENTS
MELTED
DOWN IN THE
STOMACH.

THE SMALL
INTESTINES
TAKE THEM
INTO THE BODY,
PROCESS THEM,
AND TURN THEM
INTO FOOD FOR
YOU CELLS.

THAT'S
WHAT
THAT IS?!
REALLY?!



WHAT'RE
THEY
SCRAPING
UP WITH
THOSE BIG
NETS?

OH, THOSE ARE
WHAT NUTRIENTS
LOOK LIKE BEFORE
THEY GET BROKEN
DOWN. I GUESS
YOU HAVEN'T SEEN
THEM BEFORE.

HUH...

THOSE NETS ARE
CALLED MICROVILLI.
THEY INCREASE
SURFACE AREA
SO THE BODY CAN
ABSORB MORE
NUTRIENTS.

GLORP
ゴボポポ...
GLORP

YOU'RE
RIGHT!
THAT'S
THE FOOD
WE EAT!!

AND THEN
THE ABSORBED
LACTOSE,
MALTOSE, AND
THE REST
GET BROKEN
DOWN AND
MADE INTO—
SEE?

FOR TASTING

MOST
OF THEM GET
KILLED BY
THE GASTRIC
ACIDS.

ALTHOUGH
I DO HEAR
ABOUT SOME
THAT CAUSE
PROBLEMS...

WHOA,
WHAT'S
THIS?!

HUH...
BUT DON'T
ALL SORTS OF
STUFF COME
IN FROM THE
OUTSIDE?
LIKE
VIRUSES.

DOES BAD
STUFF EVER
GET ABSORBED
BY MISTAKE?

*NOTE: THE TERM "PURINES" RESEMBLES THE JAPANESE WORD FOR "PUDDING", HENCE THEIR PUDDING-CUP APPEARANCE HERE.



...AND THAT EXCESS URIC ACID CAN LEAD TO THE FORMATION OF SHARP, DAMAGING CRYSTALS?!

DON'T GIVE ME EXCUSES!! DON'T YOU KNOW THAT BREAKING DOWN PURINES MAKES URIC ACID...

WE ABSORBED A WHOLE PILE OF PURINES!

B-BUT WHAT CAN WE DO? WE STILL HAVE TO ABSORB THEM, EVEN WHEN THERE'S TOO MANY...

Purines

Indispensable material for the composition of cellular nuclei. When broken down, purines make wastes called uric acid which are excreted from the body. Excessive uric acid can build up in the body, causing gout and kidney stones.



Lactic Acid Bacteria

Good bacteria that supports the health of the human body. They have a variety of specialties.

NYU!



YIKES, HE'S IN TROUBLE.

POOR GUY...

YEAH...

RUSTLE

CLAMOR CLAMOR

POPOP





IS IT HAPPY
NOW THAT
IT'S FULL?

WHAT'S
UP?

HI

K"RU

KU-BLE

KILL

WH...
HUH?

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

KILL

WHOA
??!

WHOOOOOSH

NYUUUU!♡

NYU?

AAAAUGH!

SPLASH

YEAH,
DEPEND-
ING ON THE
VARIETY, THEY
DO DIFFERENT
THINGS TO LIVE
ALONGSIDE THE
CELLS OF THE
BODY.

THEY'RE
AMAZING...

HUH. THEY
CAN DO
THINGS LIKE
THIS, TOO!

LACTIC ACID
BACTERIA...
THEY CAN MAKE
FRIENDS WITH
ANYONE...

BYE-BYE!

NYU
NYU!

...YEAH.

MAYBE
THE SMALL
INTESTINE
WILL BE A
COMFORTABLE
PLACE FOR
THAT ONE.

NYUU!

NYU?

HEEY!

...HEY!

TAKE
CARE...



THEY'RE
JUST
AMAZING!

WOW!
LACTIC ACID
BACTERIA
REALLY DO
HELP THE
BODY!



TURN
↳

AND JUST
SO WE'RE
CLEAR,
YOU CAN'T
SHOW
THEM TO
ANYONE.

HEY,
LOOK
LOOK.

IF OTHER
IMMUNE CELLS
SEE THEM,
I CAN'T...
HM?



HUH? WHAT'RE
YOU TALKING
ABOUT?

DON'T
GET TOO
GIDDY,
CELL
BOY.

EVEN
WHEN
THEY'RE
HELPFUL,
GERMS
ARE STILL
GERMS.

IF THEY
MAKE A
SUSPICIOUS
MOVE, I'LL
HAVE TO
DEAL WITH
THEM
ACCORDINGLY.



DING
DONG

WHAT?! IS
THERE A GERM
NEARBY?! MY
RECEPTOR'S
PICKING UP
SOMETHING!!

Receptor
Works like radar
to detect germs.

TADEAAAA!
THIS IS A
HANDHELD
LACTOSE
BACTERIUM,
AND THIS IS A
HEAD-MOUNTED
LACTOSE
BACTERIUM!

THEY'RE SO
SQUISHY AND
CUTE! TRY
PETTING THEM,
MR. WHITE
BLOOD CELL!

!!!

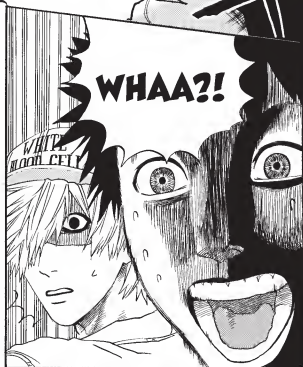


GRAB

PUT THEM
AWAY,
STUPID!! DO
YOU WANT
TO GET THEM
KILLED?!

WHOA?!
HEY, DON'T
GET MAD...

IT'S JOLT
#7



WHAA?!

WHERE
BLOOD CELT

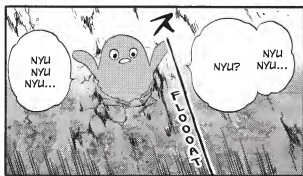


? SLIP
3. SLIP
WHOA!
OOP!
AAH!
CLANG
CLANG
CLANG

HUUUUH?
NOTHING HERE.
IS MY RECEPTOR
MALFUNCTION-
ING...?



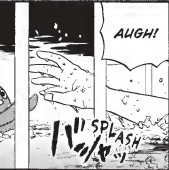
ホキッ
SPLOSH
NYU!



NYU
NYU
NYU...

NYU?
NYU
NYU...

↑
LOOK



LACTIC
ACID
BACTERIUM!!

Fwoō

oosh

IT GOT
WASHED
AWAY!!

S-
SORRY,
BUT I
CAN'T
DO
THAT!

GLUH
...?!

WHOOOSH

PANT!

PANT!

WHAT?!

I KNOW! YOU
CAN CONTACT
THE OTHER
IMMUNE CELLS
RIGHT AWAY!
TELL THEM NOT
TO KILL IT!

WE
HAVE TO
FIND IT!

WHAT DO
WE DO...?
IT WON'T
MAKE IT ON
ITS OWN.

ALL WE CAN DO
IS HOPE THAT
IT GETS FOUND
BY AN IMMUNE
CELL WHO CAN
TELL IT'S A GOOD
BACTERIA...

WE NEUTROPHILS
DON'T
HAVE ANTIGEN-
PRESENTATION
ABILITY.

NO
WAY
...

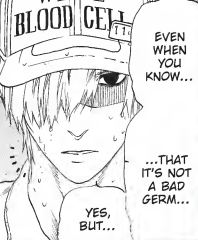
BUT IF
IT'S DEALT WITH
AS A FOREIGN
SUBSTANCE...
I CAN'T STOP IT...
I'M SORRY...

WE CAN'T
COMMUNICATE TO
OTHER IMMUNE
CELLS NOT TO
ATTACK A GERM
BECAUSE IT'S ONE
OF THE GOOD
ONES...

SPLASH

SPLASH

BUT...THE
BODY IS SO
LARGE. WE
HAVE NO IDEA
WHERE IT'LL
END UP.



NK Cell (Natural Killer Cell)
Patrols the whole body and attacks
cancerous and virus-infected cells.

**NK
CELL!**

THAT'S A
FRUSTRATING
THING TO
HAVE TO
HEAR...

IT'S
BEEN A
WHILE.

UH...
UM...

JUST
WHEN
I'M SO
HARD AT
WORK...



IF IT WEREN'T
FOR US IMMUNE
CELLS, ALL YOU
REGULAR CELLS
WOULD ALREADY
BE DEAD.

POKE

DO YOU
NEED ME
TO SPELL
IT OUT FOR
YOU?

TRACE
??...

SO YOU
WATCH WHAT
YOU SAY AND
DO, LITTLE
CELL...♡

A
LYMPHOCYTE
THAT CAN KILL
WHATEVER
CELLS I WANT
AT MY OWN
DISCRETION.

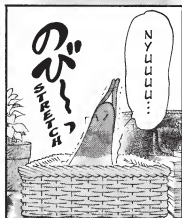
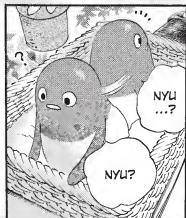
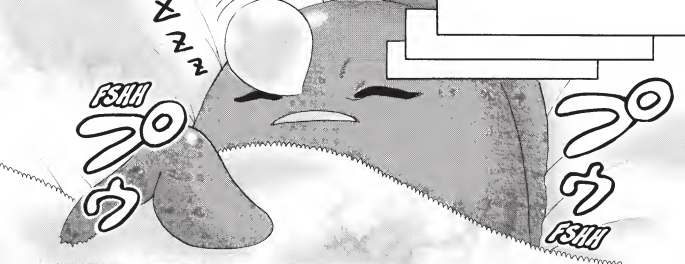
I'M
AN NK
CELL.

LACTIC ACID
BACTERIA,
PLEASE BE
SAFE!!!

AND WHAT'S
YOUR
PROBLEM?
CHUMMING
IT UP WITH
A REGULAR
CELL.

NK,
THAT'S
ENOUGH!

S-SHE'S
SO VIOLENT!!
ARE ALL
IMMUNE
CELLS LIKE
HER?!





...LITTLE
LACTIC ACID
BACTERIUM.



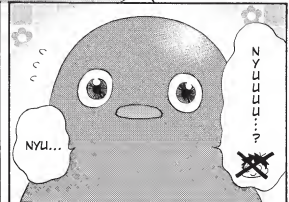
SMILE



NYU!

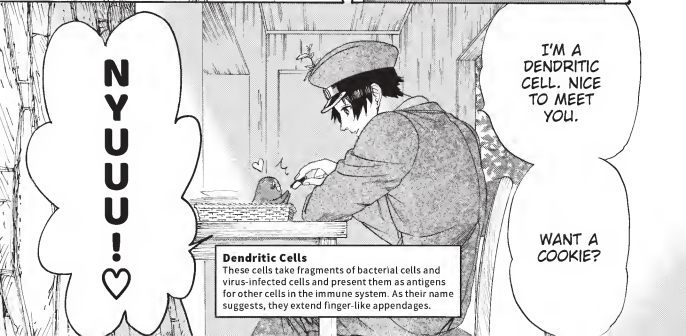
I DON'T
KNOW WHAT
HAPPENED
TO YOU...
BUT YOU CAN
REST HERE.

DO YOU
KNOW THAT
I FOUND
YOU UN-
CONSCIOUS
BY A DRAIN
OUTLET?



NYU...

NYUUUU...?



NYUUU!♡

I'M A
DENDRITIC
CELL. NICE
TO MEET
YOU.

WANT A
COOKIE?

Dendritic Cells

These cells take fragments of bacterial cells and virus-infected cells and present them as antigens for other cells in the immune system. As their name suggests, they extend finger-like appendages.

...WHAT'RE
YOU GUYS
LOOKING
FOR?

BY THE
WAY...

HEY, CELL
BOY, DON'T DO
ANYTHING TOO
OBVIOUS WHILE
NK IS HANGING
AROUND...

OH...
NOTHING
IMPORTANT.

OH? YOU
SAY THAT,
BUT YOU
SEEM TO BE
LOOKING FOR
SOMETHING
PRETTY
HARD.

BUT WE
HAVE TO
FIND IT AS
SOON AS
WE CAN!

DING
DONG
DING
DOOONG!
♪

YOU'RE
LOOKING
FOR
SOME-
THING,
TOO...?

AND YOU, NK?
WHAT'RE YOU
DOING IN A
PLACE LIKE
THIS?

WELL, I
GUESS I'M
SEARCHING,
TOO.

THERE IS
A RISK OF
INFECTION.
IMMUNE CELLS
IN THE AREA ARE
TO REPORT
TO THE SITE
IMMEDIATELY!

AN INFLUENZA
VIRUS HAS BEEN
DETECTED NEAR
THE SMALL
INTESTINE!

!

I
FOUND
YOU!!!
LACTIC
ACID
BAC—

FLOAT

HMPH.
SMALL FRY.
AT A TIME
LIKE THIS.

NK,
WHAT IS
IT YOU'RE
LOOKING
FOR...?

THAT RED
THING...

OH...

Influenza Virus

The virus responsible for the infectious disease Influenza. Largely divided into Types A, B and C, it causes symptoms such as fever above 100° F, headache, and joint and muscle pain.

**I-IT'S A
VIRUS-
INFECTED
CELL!!!**

HMPH!



...HAVE
TIME TO
WASTE
ON YOU
RIGHT
NOW!





KISHA A A H!





...SEEMS
OFF...!!

BULGE

CELL

BULGE

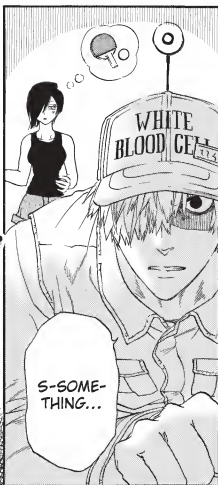
BULGE

SHAAAH!



WHAT
...?

I-IT'S
STRONG!!



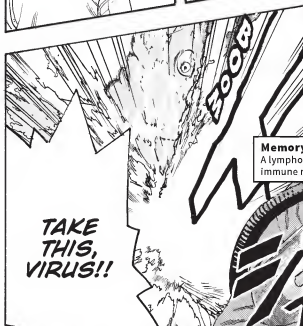
WHITE
BLOOD CELL

S-SOME-
THING...

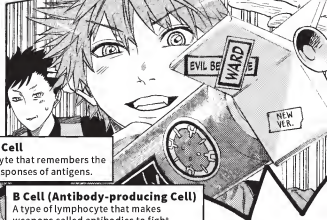


AH!

YOUR
REIN-
FORCE-
MENTS
ARE
HERE!



TAKE
THIS,
VIRUS!!



Memory Cell

A lymphocyte that remembers the immune responses of antigens.

B Cell (Antibody-producing Cell)

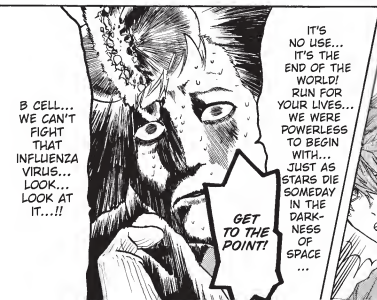
A type of lymphocyte that makes weapons called antibodies to fight antigens such as bacteria and viruses.

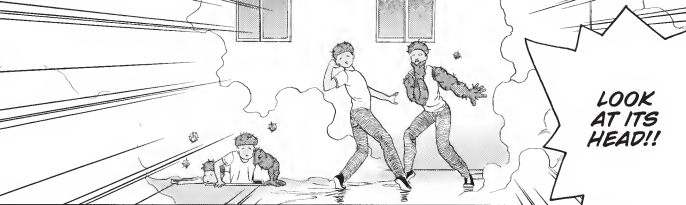


WE CAN
BEAT ANY
VIRUS WITH
THESE
ANTIBODIES!



GAAAH!!





**LOOK
AT ITS
HEAD!!**



**THE
SHAPE
OF THE
VIRUS IS
DIFFER-
ENT!!**

POKE

**SEE?!
THAT
SINISTER
POINTY
HEAD...!!**

Antigen Shift in Influenza

The influenza virus mutates easily, and the characteristics of the antigen change almost annually. Because of this, acquired immunity is sometimes insufficient to protect against it.

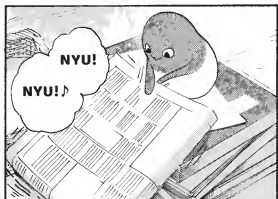
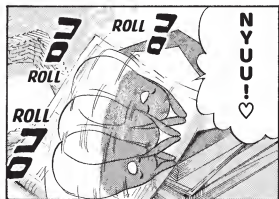
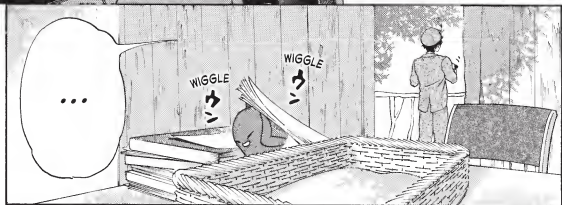
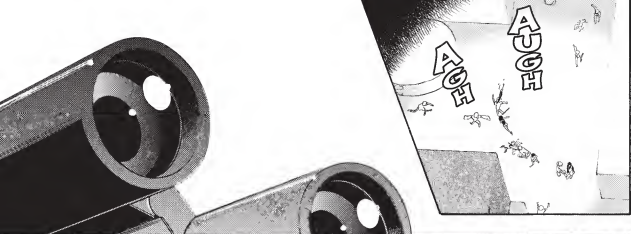


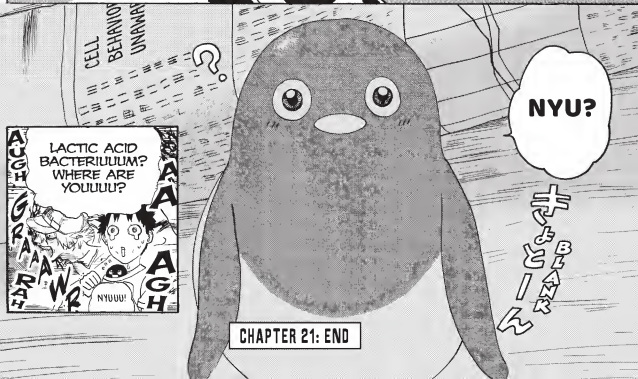
**THIS
WORLD
IS DONE
FOR!!**

**FOR
REAL
...?**

**OUR OLD
ATTACKS
WON'T
WORK
AGAINST
THEM!**

**WHAT
...?**





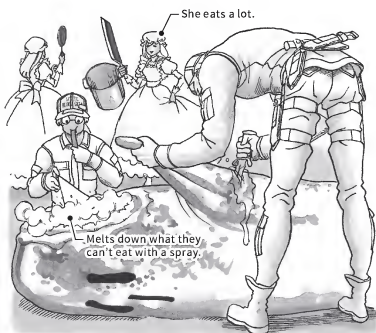
FOOD

The Life and Work of White Blood Cell (Neutrophil): What He Eats

* These are depictions created just for this comic, and differ from scientific fact.



He eats bacteria and viruses for nutrients.



When there's more than he can eat, he
gets help from the macrophages.

Cells at
Work!
はたSC細胞



YES...
WE CAN FIGHT
OLD KINDS OF
THE VIRUS,
BUT ANTIGEN-
SHIFTED
STRAINS ARE
A DIFFERENT
STORY!

**White Blood Cell
(Neutrophil)**

His main job is to destroy
foreign substances that enter
the body from the outside,
such as bacteria and viruses.



BUT
LEAVING IT
ALONE MIGHT
TRIGGER A
SURGE IN
THE NUMBER
OF INFECTED
CELLS!

Influenza Virus

The virus responsible for the
infectious disease Influenza.
The characteristics of the
antigen change almost
every year.

WE
DON'T KNOW
ANYTHING
ABOUT THOSE.
WE HAVE NO
INFORMATION
AT ALL!



WHAT
ABOUT
THIS?!
TAKE
THAT!!

ACK! I
HAVE TO TRY
SOMETHING,
EVEN IF IT
MIGHT NOT
WORK...

**B Cell (Antibody-
producing Cell)**

A type of lymphocyte that
makes weapons called
antibodies to fight antigens
such as bacteria and viruses.

THERE'RE
TOO MANY
PEOPLE
IN THESE
ALLEYS!
LET'S FIGHT
IT IN A
PLAZA!

NO
GOOD!



SHAH!

SHOOM!

SHA
SHA!

WHOA!



WHAM

THUD

OUT
OF THE
WAY,
CELL!

GUH!

WHITE
BLOOD
CELL...



CRASH

AUGH!!

GAH!

CRASH





I'VE NEVER SEEN MOVES LIKE THESE!

AND...SO FAST...!!

KUH!

WHIP

WHIP

SHAAA SHA SHA!

WHY, YOU—

I'VE GOT WORK TO DO!!

NK Cell (Natural Killer Cell)
Patrols the whole body and attacks cancerous and virus-infected cells.



THEY'RE DODGING ALL YOUR ATTACKS!!

GUH...?!

WHAT'S THE MATTER, MS. NK?! AREN'T YOU A PRO AT KILLING INFECTED CELLS?!



WHAT'RE THEY DOING...?

ももも
RUN RUN RUN
ドドド

WH-WHAT'S THAT?

クン



シュー
PSHHHH

SHAA!!



フワフワ...
FLUSH

HUH...?
MS. NK?

SH-SHUT UP. NO INFLUENZA VIRUS IS GONNA BEAT ME... UIRGH...



...

ヒッ
オオオ
オオオ



トコ
WHIR
RRR
RRR
RRR

ROAR

WH-WHAT?!

**THEY'RE
CAUSING A
STOMACH-
ACHE!!!**

CHAPTER 22: CYTOKINES



OW... WHAT
HAPPENED
TO THE
LACTIC ACID
BACTERIUM
...?

PROTECT
IT.

WHITE
BLOOD
CELL!

YOU
GRABBED
IT!



SHAAA!
SHA
SHA
SHA!

KISHAAA!
SHA
SHA SHA!

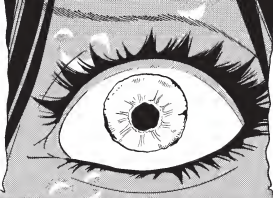


NK! YOU
CAN'T
FIGHT
IT UP
CLOSE!
GET
AWAY
FROM
IT!!

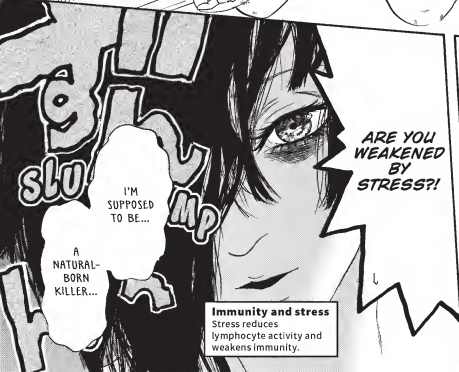
UGH...

...KILL...
THESE
SCUM...
GAH.

WHY...
CAN'T
I...



I JUST
CAN'T...



I'M
SUPPOSED
TO BE...

A
NATURAL-
BORN
KILLER...

ARE YOU
WEAKENED
BY
STRESS?!

Immunity and stress
Stress reduces
lymphocyte activity and
weakens immunity.

NK,
ARE
YOU—

MS.NK, WHAT'S
WRONG?! YOU'RE
OUR KEY TO
FIGHTING VIRUS-
INFECTED CELLS!



COULD
IT BE—

H-HOLD
ON,
MS. NK,
YOU
CAN'T—

CRASH

WHO'S
GOING
TO STOP
THESE
GUYS?!!

NK!
SNAP
OUT OF
IT!

WHAT
AM I
DOING
...?

I JUST...
CAN'T
ANY-
MORE...

I
CAN'T...

FLICK

ヒュッ
ブウウッ

NK!! DON'T
STOP BELIEVING
IN YOURSELF!
WE'RE PROS!
WE'VE TRAINED
FOR THIS!

THWICK

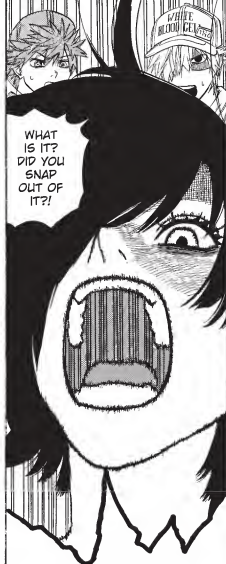
EARLIER...
I STOOD UP
FOR YOU,
NEUTROPHIL,
BECAUSE
PEOPLE
WERE
ON YOUR
CASE...
BUT YOU
JUST GOT
MAD AT
ME...

I DIDN'T
KNOW!
SORRY NK!!
AND THANK
YOU!!

...HM?

IF WE WORK
TOGETHER, WE
CAN DEFEAT ANY
ENEMY!! PUT YOUR
HEART INTO IT!!
GET UP!! GET UP
AND RUN!!





WHAT
IS IT?
DID YOU
SNAP
OUT OF
IT?!

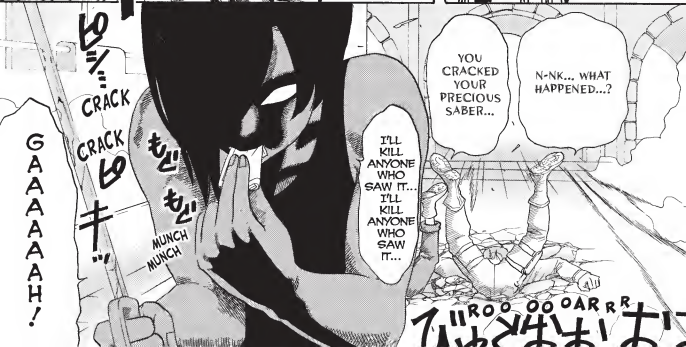
GYAAAAH!!



**K
TAT**

DA

T



WHO HAD
THAT
PICTURE...?!

SMASH



HEH
HEH
HEH...

BUT
HOW...?!

NK! DID YOU
BECOME
ACTIVATED?!

ゴオオオオオ BW O O O O O SH O O O O O

THANKS TO THESE
POLYSACCHARIDES
YOU MADE—

MMM...
THANK YOU
SO MUCH,
LACTIC ACID
BACTERIUM.

NYU?

HEH
HEH...

GULP

IT'S
BEEN A
LONG
TIME...

EXCUSE
ME.

SNAP

キ

SWISH

GROW
GROW

NYUI

NYUI



...SINCE
I'VE BEEN
ACTIVATED!



ヒュー
ヒュー
ヒュー
HICcup!

Dendritic Cells

These cells take fragments of bacterial cells and virus-infected cells, and present them as antigens for other cells in the immune system.



HEY, THAT
TORNADO'S
CLOSING IN!
LET'S GET OUT
OF HERE!!

DENDRITIC
CELL?! WHY
ARE YOU
DRESSED LIKE
THAT...?



HEY
EVERYONE,
OUR ENEMY
TODAY...

SH
STEP
7

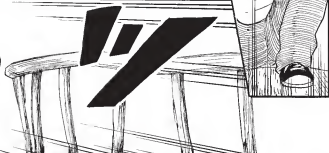
SHAAAH!

The work of lactic acid bacteria

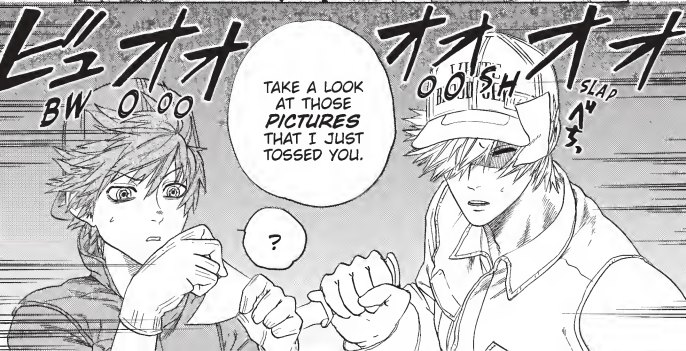
Some lactic acid bacteria produce polysaccharides that help regulate the immune system. These immunomodulatory polysaccharides are thought to activate dendritic cells.



...IS REALLY
STRONG!



SO I'LL
LEND YOU
MY SUPPORT
IN THE
BACKGROUND.



TAKE A LOOK
AT THOSE
PICTURES
THAT I JUST
TOSSED YOU.

?



PLEASE SEE
HOW YOU WERE
WHEN YOU WERE
YOUNGER, AND RECALL
YOUR ENERGY AND
ENTHUSIASM OF
THOSE DAYS.

FLUSH

オ

ザップ
ザップ

HICUP!

BUT...YOU
WORK BETTER
UNDER THESE
CIRCUMSTANCES,
DON'T YOU? WE
HAVE THE DATA
TO PROVE IT.

NO, I'D
RATHER NOT
HAVE TO DO
ANYTHING SO
DRASTIC.

THEN
DON'T
DO IT!

CYTOKINES

IL-12

CYTOKINES

SO LET ME
LEAD BY
EXAMPLE...
HEH HEH!♡

AND
WORK
HARDER
THAN
USUAL!♡

Cytokines

A blanket term for
proteins that affect
specific types of cells.

I'M
ALREADY
ACTIVATED!
HOLD
ON—

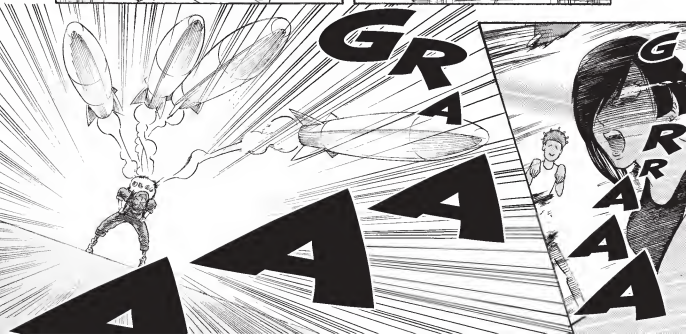
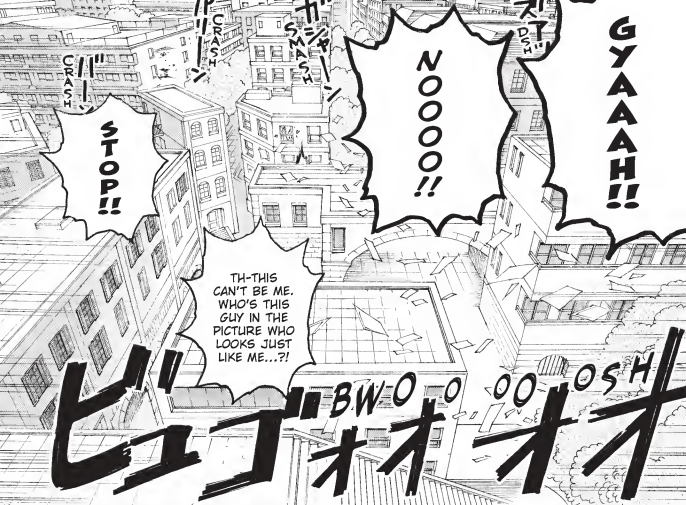
I'LL WORK AS
HARD AS I CAN!
YOU DON'T HAVE
TO DO THIS!!

DENDRITIC
CELL,
WAIT! NO
MORE—



Boosting Immunity

The activation of dendritic cells is thought to increase the activity of NK cells and the production of antibodies against certain viruses by producing cytokines.



GRR AAR

SMASH

SMASH

KABOOM

BOOM

BOOM

BAM

BAM

BAM

BAM

YES. IT'S
ALL THANKS
TO THE POLY-
SACCHARIDES
THIS LITTLE
ONE MADE.
♡

IT'S BECAUSE
YOU ACTIVATED
MR. DENDRITIC
CELL THAT
EVERYONE
GOT ALL...
LIKE THAT!

I
SEE!

NYU?



WE
MANAGED
TO BEAT THE
INFLUENZA
VIRUS
BECAUSE OF
YOU!!

LACTIC
ACID
BACTERIUM!

YOUR
FRIENDS
ARE
HERE.

LOOK
AT ME...
DROPPING
YOU IN THE
CANALS,
GETTING
BLOWN AWAY
BY THE
TORNADO...

YOU'RE
ALL SO
MUCH
COOLER
THAN
ME.

I'M
SORRY FOR
PUTTING YOU
THROUGH
SUCH A
HARD TIME.

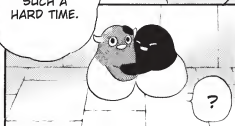
YOU'RE
SO
SMALL...

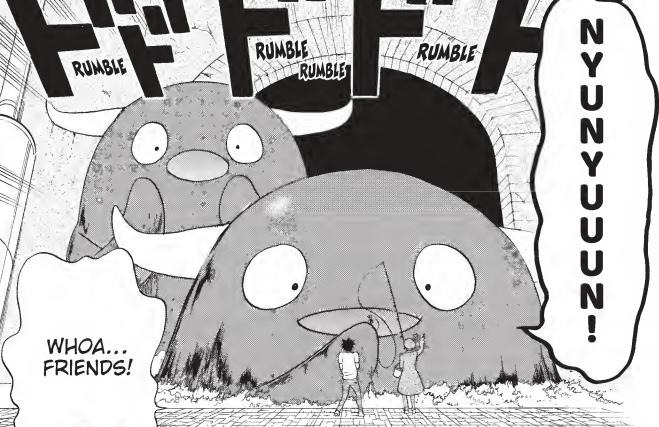
BUT
YOU'RE
JUST
AMAZING...

NYU...
♡



OKAY!







OH
RIGHT.

WHOA,
YOU'RE
COVERED
IN
BLOOD.

BY THE
WAY,
WHITE
BLOOD
CELL...

ONE
LEFT TO
GO.



PHEW...

NYUUU!

RUMBLE
NYUUU!



NO...
I'M SORRY,
TOO.

FOR
SCARING
YOU,
FOR NOT
BEING ABLE
TO TELL
MY COL-
LEAGUES...



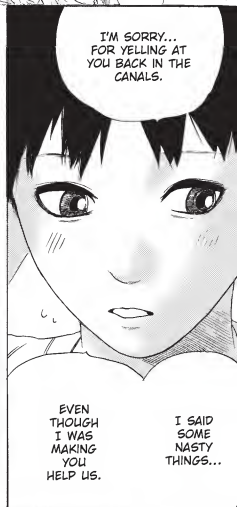
IT'S
OKAY.

I'M
SORRY.

FOR NOT
BEING
ABLE TO
HELP...



I WAS REALLY
GLAD THAT
YOU CAUGHT
THE LACTIC
ACID BACTERIUM
WHEN WE WERE
BLOWN AWAY BY
THE TORNADO...
THANK YOU.



I'M SORRY...
FOR YELLING AT
YOU BACK IN THE
CANALS.

EVEN
THOUGH
I WAS
MAKING
YOU
HELP US.

I SAID
SOME
NASTY
THINGS...



...I'M
GOING TO
APOLOGIZE
PROPERLY
TO THE
OTHERS,
TOO.

GREAT,
THEN...

I'M
ACTUALLY
HAVING
SOME FUN
ON THIS
TR-



AND...
DON'T FEEL
LIKE YOU'RE
MAKING ME
HELP YOU.



LEAVE
THEM BE,
PLEASE!

I HAD NO
IDEA YOU WERE
BEING MADE
TO FIGHT WITH
EMBARRASSING
PICTURES FROM
THE PAST!

LEAVE
THEM
BE.

HEY,
SORRY
IMMUNE
CELLS!
I DIDN'T
KNOW!

I DON'T
KNOW WHAT
YOU'RE
TALKING
ABOUT...
I DON'T
KNOW WHAT
YOU'RE
TALKING
ABOUT...

CELL
BOY,
WAIT.

STEP

STEP

STEP

STEP



NOW
YOU'RE THE
ONLY ONE
LEFT—

NYUU!



HOLD ON
A SECOND.
I'M GOING TO
TALK WITH NK
FOR A BIT.

JUST REMEMBER
PEOPLE CAN'T
SEE THAT THING.

A-ANYWAY,
LET'S GET
THE LAST
ONE HOME.

OKAY!
OH,
RIGHT.



ARE YOU
LONELY?

HA HA...
IT'LL BE ALL
RIGHT. I'M
GOING TO GET
YOU TO YOUR
FRIENDS.

NYU!





HUH?!

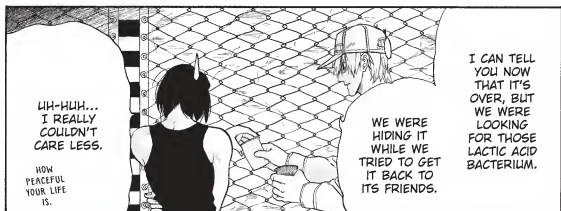
NK, I
WANT
TO TALK
TO YOU.



GRR!

I'M
GONNA
KILL THAT
LEAFY
BASTARD...
WAIT,
NO!!

WHY
AM I SO
EMO-
TIONALLY
FRAGILE
...?!



UH-HUH...
I REALLY
COULDN'T
CARE LESS.

HOW
PEACEFUL
YOUR LIFE
IS.

WE WERE
HIDING IT
WHILE WE
TRIED TO GET
IT BACK TO
ITS FRIENDS.

I CAN TELL
YOU NOW
THAT IT'S
OVER, BUT
WE WERE
LOOKING
FOR THOSE
LACTIC ACID
BACTERIUM.



...OH.

SO THAT'S
WHAT YOU
WANT TO
KNOW.



**SO,
NK.**

WHAT
WAS IT
THAT YOU
WERE
LOOKING
FOR?

IT'LL
DOUBLE
AS A
WARNING.

FINE. IT'S
NOT LIKE
IT DOESN'T
CONCERN YOU,
TOO, SO I'LL
TELL YOU.

WHAT?

...NO
MATTER
WHAT
IT IS.

NEUTROPHIL,
YOU SHOULD
KILL THE
ENEMY WITHOUT
A SECOND
THOUGHT...

YES...

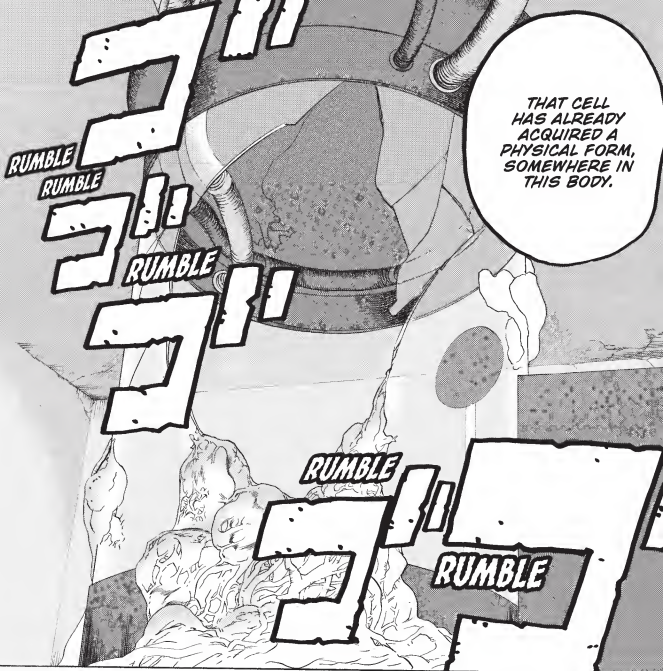
AND
YOU ALSO
KNOW THAT
WITH THAT
INFORMATION,
CELLS CAN BE
"COPIED."

YOU KNOW
THAT THE
INFORMATION
ON THE CELLS
WE KILL ARE
STORED AS
ANTIGENS,
RIGHT?

ALONG WITH
THE GENETIC
INFORMATION
RECORDED
WITH IT.

THE ANTIBODY
INFORMATION
OF A CERTAIN
CELL WAS
LEAKED.

WHAT?!



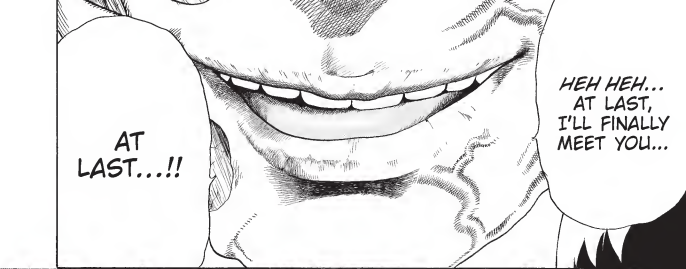
THAT'S
WHO I'M
LOOKING
FOR.

HEH...

HEH HEH
HEH...

IT'S
SO NICE
TO HAVE
MY OWN
BODY.

IS
THAT
SO?



AT
LAST...!!

HEH HEH...
AT LAST,
I'LL FINALLY
MEET YOU...



THIS'LL
BE SO
MUCH
FUN.

CHAPTER 22: END

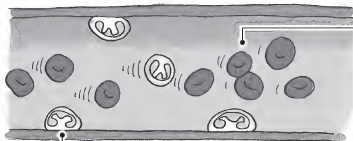
RESIDENCE

The Life and Work of White Blood Cell (Neutrophil): Where He Lives

* These are depictions created just for this comic, and differ from scientific fact.

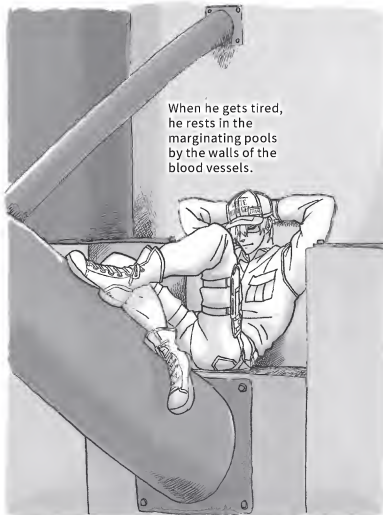
Even though neutrophils patrol the body at all hours, there are places where they can rest. They live in the circulating and marginating pools in the blood vessels.

Marginating pools stick to the vessel walls or flow slowly.



Circulating pools flow in the middle of the blood vessel.

When he gets tired, he rests in the marginating pools by the walls of the blood vessels.

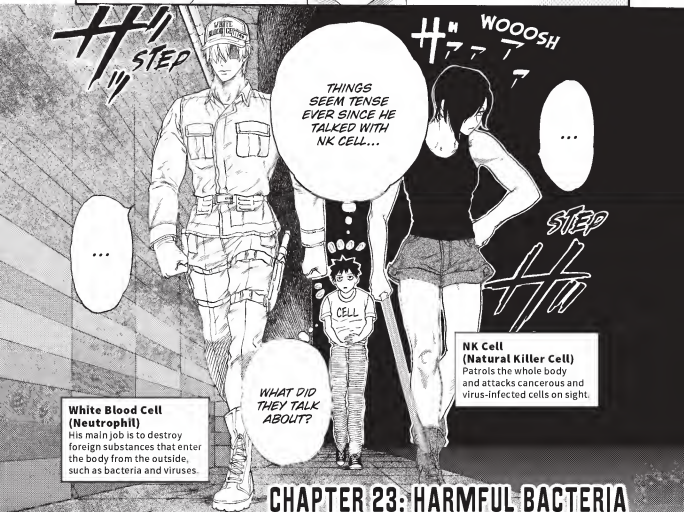


Cells at
Work!
はたSC細胞



WHAT
HAPPENED?

...



**White Blood Cell
(Neutrophil)**

His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.

WHAT DID
THEY TALK
ABOUT?

**NK Cell
(Natural Killer Cell)**

Patrols the whole body and attacks cancerous and virus-infected cells on sight.

CHAPTER 23: HARMFUL BACTERIA



LOOK—

OH...
WE'RE
ALMOST
THERE.

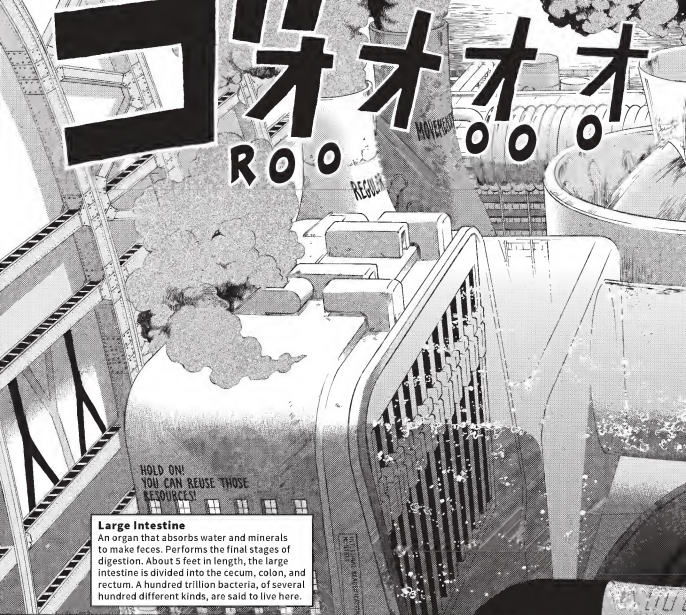
UM—DO
WE HAVE TO
GO MUCH
FARTHER?

...

KEEP THE
INTESTINES CLEAN

THIS IS
THE LARGE
INTESTINE.





Large Intestine

An organ that absorbs water and minerals to make feces. Performs the final stages of digestion. About 5 feet in length, the large intestine is divided into the cecum, colon, and rectum. A hundred trillion bacteria, of several hundred different kinds, are said to live here.



YES...
THAT'S TOXIC
GAS FROM
HARMFUL
BACTERIA
LIVING IN THE
INTESTINE.

THE BALANCE
BETWEEN THE
INTESTINAL
BACTERIA MUST
BE OFF, WITH
THE HARMFUL
BACTERIA
HAVING THE
ADVANTAGE.

IS
SOMETHING
WRONG?



THIS IS
PRETTY
BAD.

COUGH!

IT'S IN
BAD
SHAPE.

Harmful bacteria

Include pathogenic *Escherichia coli*, *Staphylococcus*, and *Clostridium*. They break down proteins and make harmful byproducts.

...HARMFUL
BACTERIA
THAT HURT THE
BODY...

The balance between intestinal bacteria

A typical ratio in a healthy individual is 20% good bacteria, 10% harmful bacteria, and 70% opportunistic bacteria.

Good bacteria

Include lactic acid bacteria, *L. gasseri*, and *Bifidobacterium*. They can help strengthen immune response and promote intestinal activity.

GOOD
BACTERIA
THAT BENEFIT
THE BODY...

...AND
OPPORTU-
NISTIC
BACTERIA.

Opportunistic bacteria

Include *Bacteroides*, nonpathogenic *Escherichia coli*, and *Eubacterium*. Neither helping nor harming the body, they work with whichever bacteria that have the advantage.

HE SAYS
"PROBLEM
SOLVED," BUT
HE SURE
ISN'T ACTING
LIKE IT...



THEN
WE'LL BE
ABLE TO
FIND THE
FRIENDS
OF OUR
LITTLE
BUDDY
HERE!

YEAH...
PROBLEM
SOLVED...

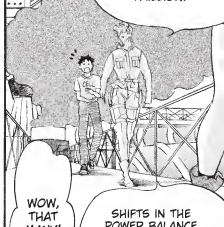


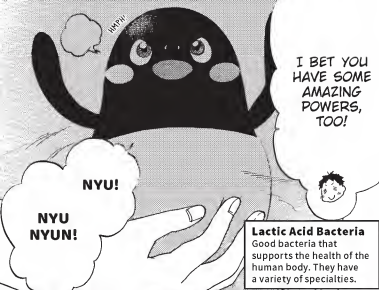
コオオ
ROAR.

IT'S SAID
THAT THE TOTAL
NUMBER OF
BACTERIA CAN
BE A HUNDRED
TRILLION.

WOW,
THAT
MANY!

SHIFTS IN THE
POWER BALANCE
BETWEEN THEM CAN
CAUSE CHANGES
IN THE HEALTH OF
THE BODY.







WE'LL JOIN
YOU AS SOON
AS THERE'S
AN ANTIGEN
PRESENTATION
SIGNAL!!

WATCH
YOURSELF,
BOSS!

GOOD.



EVEN AS A
MEMORY T
CELL, I CARE
ABOUT YOU
GUYS JUST
AS DEEPLY.

YOU MIGHT
MISS ME,
BUT BE
STRONG!



I'M
THE ONLY
ONE WHO
KNOWS OUR
ENEMY'S
TRICKS AND
HOW TO
HIT HIM
WHERE IT
HURTS...

ALTHOUGH,
AS YOUR
BOSS, I AM
WORRIED
IF YOU'LL
BE ABLE
TO FIGHT
WITHOUT
ME...

IS HE
CONFUSING
IT FOR A
PROMOTION...?

BOSS
LOOKS
HAPPY.

...AND GO
TO THE
FRONT
LINES TO
TAKE HIM
DOWN!!



BUT IF
WE AREN'T...
I'LL SEE
YOU GUYS IN
HELL...!!

BOSS....!!

THERE'S NO
TELLING IF
WE'LL ALL BE
ALIVE WHEN
WE SEE
EACH OTHER
AGAIN...

I SWEAR
ON THIS
HAT THAT
I'LL
COMPLETE
MY
MISSION.

Memory T Cells

Some Killer T cells become Memory T cells, and prepare to attack in case the same enemy appears again.





N-NO!
I'M NOT!
I'M NOT!
I'M NOT!
I'M NOT!
I'M NOT!

TH-THAT'S
NOT TRUE.
IT MIGHT LOOK
LIKE IT'S TRUE
BUT REALLY
IT'S NOT.

UM... I
THINK I'M
MISSING
SOME-
THING.

WHO'S THIS
"HE" YOU GUYS
KEEP TALKING
ABOUT...?

THEY'RE
MORONS,
ALL OF
THEM.

ARE YOU GONNA
CHUM IT UP WITH
SOME BACTERIA
FOR YOUR NEXT
SCHEME?!

WHAT'RE
YOU DOING
HERE?!
HUH?!

AND WHAT
ARE YOU
DOING
RELAXING
WITH A
REGULAR
CELL?!

AT THIS
RATE YOU
WON'T EVEN
BE ABLE
TO KILL A
GERM!

I AM NOW
PREPARING FOR
BATTLE. CELL BOY, IT'S
DANGEROUS HERE,
SO YOU SHOULD GET
SOMEPLACE SAFE.

NO,
THAT'S JUST
NOT POSSIBLE.
I'M A NATURAL-
BORN KILLING
MACHINE.

RIGHT!
RIGHT!

NYUUUU!

WHAT'S THAT
SQUEALING?

YEAH! YOU'LL
TOTALLY BE
IN OUR WAY
WHEN WE
HAVE TO
FIGHT HIM!!

WHITE
BLOOD CELL

A
CANCER
CELL.

CANCER
CELL?!!

C...

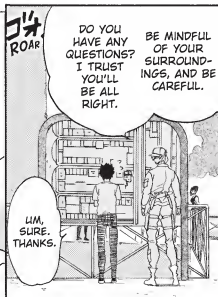
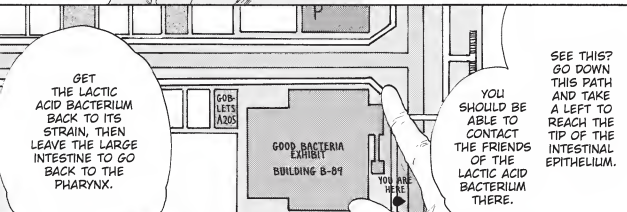
CELL



IT'S TIME FOR ME TO GET BACK TO WORK.

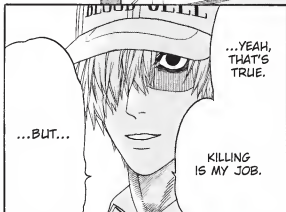
OF COURSE HE'S DANGEROUS.

THAT'S WHY WE HAVE TO HUNT HIM DOWN AS SOON AS POSSIBLE.





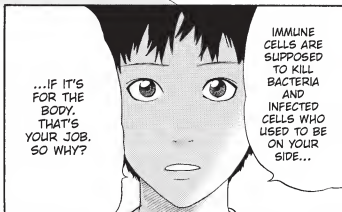
WHITE
BLOOD CELL...
WHY DID YOU
PROTECT US?



...BUT...

...YEAH,
THAT'S
TRUE.

KILLING
IS MY JOB.



...IF IT'S
FOR THE
BODY,
THAT'S
YOUR JOB.
SO WHY?

IMMUNE
CELLS ARE
SUPPOSED
TO KILL
BACTERIA
AND
INFECTED
CELLS WHO
USED TO BE
ON YOUR
SIDE...

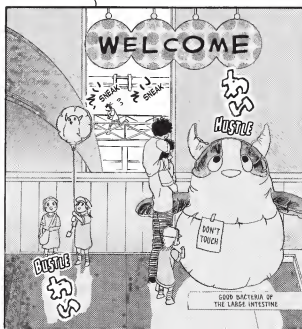
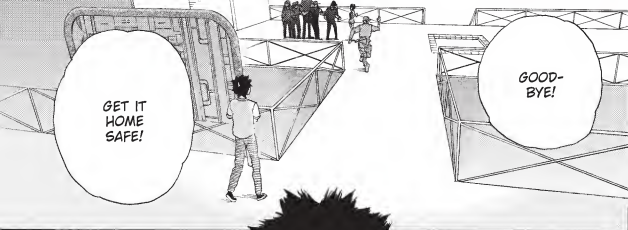


MAYBE I
NEEDED A
BREAK FROM
ALL THE
KILLING.

MAYBE
THAT'S
WHY.

Immune cells and gut bacteria

It's said that immune cells attack pathogens that infiltrate the body, but not gut bacteria that co-inhabit the body, even when they are non-self antigens.





ゴキウ
ROO OOO
OARR

THEY SAY THERE
ARE COUNTLESS
BACTERIA ON THE
OTHER SIDE OF
THESE WALLS.

CELL

NYUUU!

ホ
ボ GLRP
GLRP

ホ
ボ GLRP
GLRP

IT'S
ALMOST
GOOD-
BYE.

NYUU!

IT WAS
SCARY AT
TIMES...

YOU
KNOW—

NYUU!!

...BUT I
HAD FUN,
LACTIC ACID
BACTERIUM!

SO I...
NEVER HAD
PLAYMATES
AS A KID...

THE CELL
THAT MADE
ME...

...WAS INFECTED
WITH SOMETHING
AND KILLED BY
AN IMMUNE CELL
SOON AFTER I
WAS BORN.

NYUN!!
NYUU
NYU!!

HEE
HEE
HEE.

**...AND
TRAVELING
ALL OVER
THE BODY!!**

SO
I HAD
A LOT
OF FUN
MEETING
YOU...

DON'T
GIVE UP,
GOBLET
CELL!!

IT'S NO USE!
THE BACTERIAL
ATTACKS ARE
TOO MUCH. IT'S
ONLY A MATTER
OF TIME!

НЦН?

Responsible for absorbing fluids and nutrients. They also build up a mucous barrier to prevent excessive immune response against the intestinal bacteria.

Mucous-secreting cells secrete the viscous substance mucin. They also live in the small intestine, but are especially prevalent in the large intestine.



NYU!

IT LOOKS LIKE THEY'RE IN TROUBLE.

WE INTESTINAL EPITHELIAL CELLS HAVE TO STOP THEM WITH THE INTESTINAL BARRIER!!



DO YOU KNOW HOW MANY BACTERIA ARE ON THE OTHER SIDE OF THIS WALL?!

Intestinal Barrier

SPLASH

GO

CRACK

EEK!

AAAAUGH!
I'M TELLING YOU, EVEN IF WE GO NOW, THERE'S NO WAY WE'D MAKE IT IN TIME!



LIKE I SAID, WE'RE AT OUR LIMIT HERE...!

ISN'T THAT OUR MOTTO? WE HAVE TO TRY UNTIL WE CAN'T!!

OUR INTESTINAL BARRIERS HAVE TO BE AS FIRM AS OUR WILL!!

C- CAN I HELP ...?

CRACK

RAGLUNG



DON'T GIVE UP!!

THERE'S NO WAY! COME BACK!



...THAT WE
HAD BEEN
WORKING
SO
HARD TO
REACH...!

HEH HEH
HEH...
SO THIS IS
THE OTHER
SIDE OF THE
INTESTINAL
WALL...

THERE'S NOT
EVEN A HINT
OF ANY STYLE
OR TASTE.

NOW THAT
WE'RE HERE,
IT'S NOT
MUCH TO
LOOK AT.

WHO CARES?
WE'LL TURN
THIS INTO A
PARADISE FOR
US HARMFUL
BACTERIA.

POOOUR
サ
ア
ア

LOOM
F



BE COURTEOUS WHEN YOU
TRANSMIGRATE

02

4
3 STEP

4
STEP

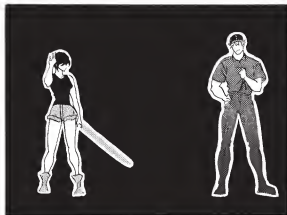
OH...
THE PATH
GETS
NARROW
HERE.

DRIP
ニ

LYMPH DUCTS (INTESTINES)

Immune cells and gut bacteria

It's said that immune cells attack pathogens that infiltrate the body, but not gut bacteria that co-inhabit the body, even when they are non-self antigens.





WHY'RE YOU
FOLLOWING
ME?! YOU'RE
SUPPOSE
TO BE A
LONER!!

I SHOULD BE
TELLING YOU
THAT! AND YOU
BUMPED INTO
ME FIRST!!

HOW
WOBBLY
ARE YOU?!
GO HOME!!
YOU'RE
GONNA
GET IN THE
WAY!!!

MY
YEARS OF
EXPERIENCE
AND
INSTINCT
SAY HE'S
THIS WAY!!
YOU'RE
THE ONES
FOLLOWING
ME!!

STOP
BEATING
ON EACH
OTHER
BEFORE
THE
FIGHT...

HEY...

BOOM

CALL ME
MEMORY T!!
DON'T YOU
SEE THIS
HAT?!

SEE?! WE'RE
ALMOST IN A
RESIDENTIAL AREA!
LOTS A PEOPLE!
ARE YOU SURE AN
OUTCAST LIKE
YOU CAN
HANDLE IT?

SLAP

THE ENEMY
COULD BE
ANYWHERE!!

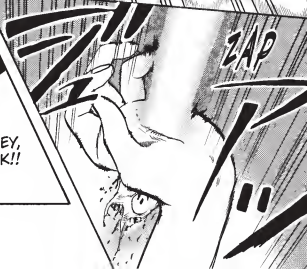
ALL RIGHT,
NOW
QUIET!!

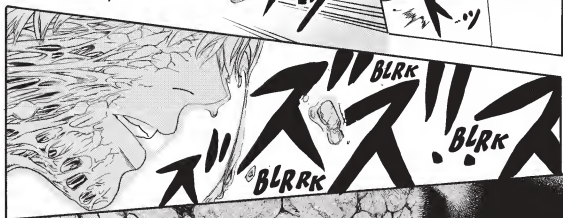
MEMORY

GLARE

SHH!!

WHA—WHY ARE
YOU CHEWING ME
OUT?! IT'S NOT
FAIR!!







SLASH

LEAP

WHITE
GOLDEN CELL

NK!
GO!!

WHOOSH

!

DID YOU
COME BACK
TO LIFE...

DIE!

SH-AB

CANCER
CELL!!!

...JUST
TO COM-
PLAIN
SOME
MORE?!

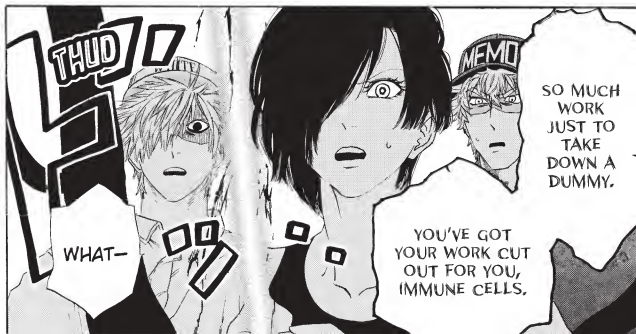


DID
I GET
HIM...?!

AH HA
HA HA
HA HA
HA!

YOU FELL
FOR IT!
THIS IS
JUST A
PUPPET.

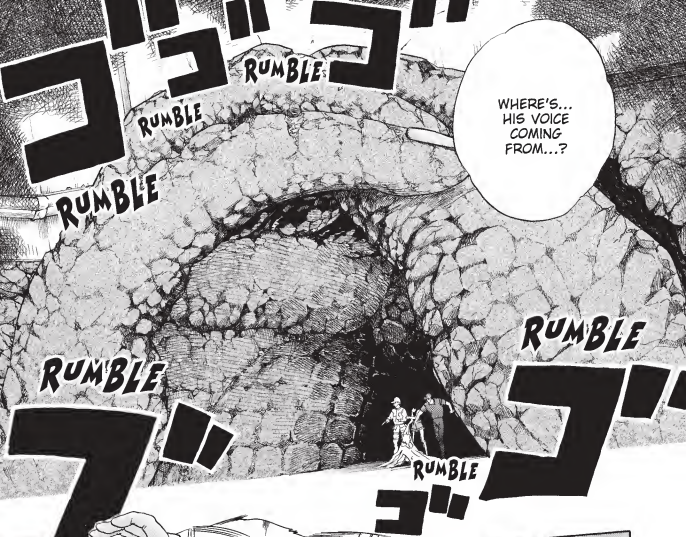
シュウ
ウ
ウ
P
S
H
H
H



WHAT-

YOU'VE GOT
YOUR WORK CUT
OUT FOR YOU,
IMMUNE CELLS.

SO MUCH
WORK
JUST TO
TAKE
DOWN A
DUMMY.



WHERE'S...
HIS VOICE
COMING
FROM...?



WHAT
?!!

SMASH

CRASH

RUMBLE

ズ"ズ"ズ"

CRASH

CRASH

GAAAAA

GASP!

WHOOOM

AAAAAGH!

HA HAH
HAH...
I'M SO
HAPPY.

IT'S
THE SAME
THREE OF
YOU FROM
BEFORE.

THUD

GAH—





Cancer cells

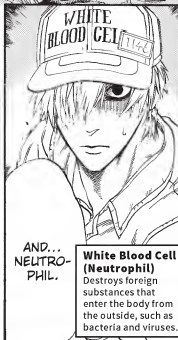
Cells that multiply uncontrollably due to a genetic anomaly. They overstep the boundaries with neighboring normal cells.

IT'S
GOOD
TO SEE
YOU.

CHAPTER 23: END



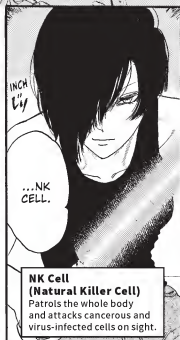
Cells at
Work!
はたSC細胞



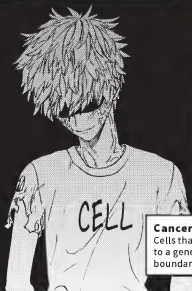
White Blood Cell (Neutrophil)
Destroys foreign substances that enter the body from the outside, such as bacteria and viruses.



Memory T Cell
Some Killer T cells become Memory T cells and prepare to attack in case the same enemy appears again.

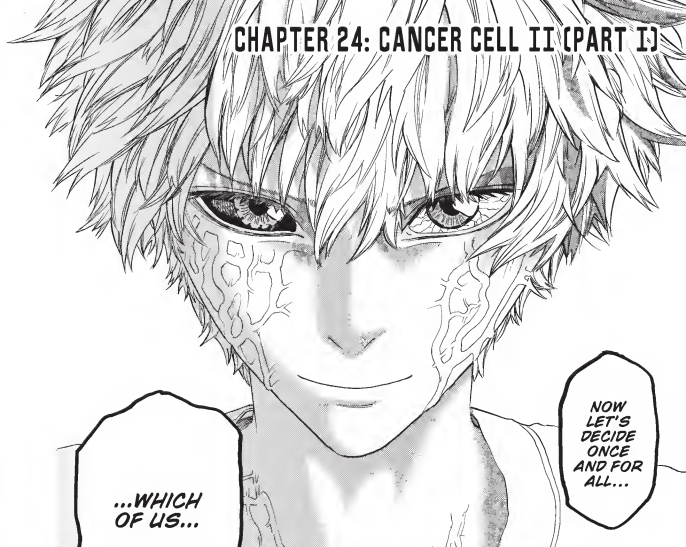


NK Cell (Natural Killer Cell)
Patrols the whole body and attacks cancerous and virus-infected cells on sight.



Cancer cells
Cells that multiply uncontrollably due to a genetic anomaly. They overstep the boundaries with neighboring normal cells.

CHAPTER 24: CANCER CELL II (PART I)



...WHICH
OF US...

NOW
LET'S
DECIDE
ONCE
AND FOR
ALL...



....!!

...IS
ON THE
SIDE OF
JUSTICE.



HERE
HE
COMES!!

WHOOSH
WHY
BLOOD

SH

SHOOM

HEH
HEH.

BOOM

GRAB

PULL

GAH!

DRAG

GAH!



WHAT
PREDICTABLE
ATTACKS.☆

HAH.

は **TA** **DAH** ン

HEY!! UNTIE
US BEFORE
YOU STRIKE
A POSE!!

THANKS,
NK!!

DID
YOU REALLY
THINK
YOU COULD
WIN THIS
TIME?

KTCH
#!!

WHY
DID YOU
COME BACK
TO LIFE
KNOWING
YOU'D JUST
BE KILLED
AGAIN?

SO, KIDDO,
CAN YOU
TELL ME?

I
JUST...

...I'M...

...NOT
HERE TO
START A
FIGHT.

DON'T YOU
KNOW YOU
SHOULDN'T
START A FIGHT
AGAINST
AN ENEMY
WHO KNOWS
ALL ABOUT
YOU...? HM?

THIS
IS MY
SECOND
TIME
FIGHTING
YOU.

...FOUND
WHAT IT
IS I'M
SUPPOSED
TO DO.

BLOK

BLOK

BLOK

BLOK



THESE
ARE THE
SAME AS MY
PUPPET FROM
EARLIER.

HEH HEH...
SURPRISED?

THERE'S
NOTHING
YOU CAN
DO TO STOP
THEM.

YOU
CAN'T KILL
THEM WITH
SWORDS.
...THEY'LL
KEEP MOVING
FOREVER.

THEY'RE ALL
A PART OF
MY TISSUE.

SO SIT TIGHT,
AND YOU'LL
BE GOOD AND
CAPTURED SOON
ENOUGH.



...YOU'RE GOING TO DO NEXT!!

VWEEEM
ガッ

...EXACTLY WHAT...

...YOU'RE GOING TO DO NEXT!!

...EXACTLY WHAT...

VWEEEM
ガッ

...YOU'RE GOING TO DO NEXT!!

...EXACTLY WHAT...

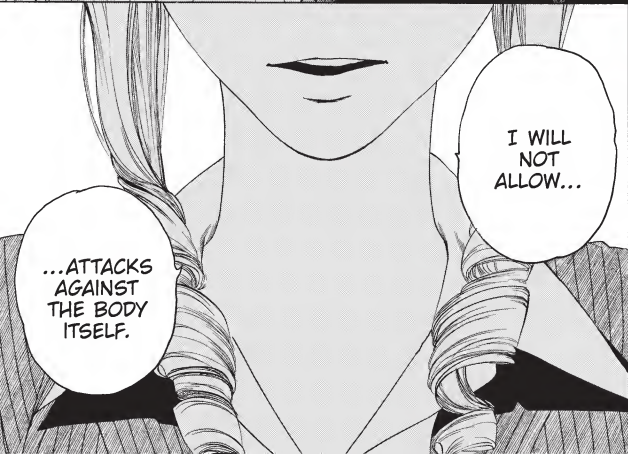
VWEEEM
ガッ



PLEASE
CEASE YOUR
ATTACKS.

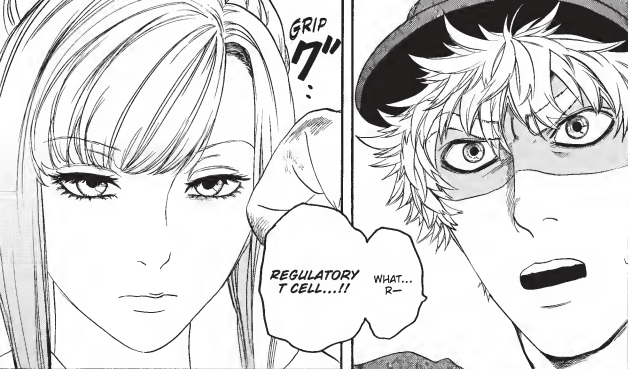
YOUR
RESPONSE
IS NOT
APPROPRIATE.

WHAT
THE—





Regulatory T Cell
She regulates the activity
of T cells to prevent
immune system anomalies.





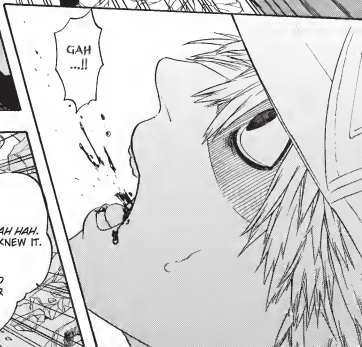
N-
NEUTRO-
PHIL!!



GAH...
COUGH.

HAH HAH.
I KNEW IT.

I KNEW
YOU'D TRY AND
PROTECT YOUR
FRIEND.



GAH
...!!



HAAH!
HAAH!

HAAH!

SPLASH

SPLASH

KACHUNK
KACHUNK

ARE THOSE
GERMS STILL
BEHIND US?!

**Intestinal
Epithelial Cells**

Responsible for absorbing fluids and nutrients. They also build up a mucous barrier to prevent excessive immune response against the intestinal bacteria.

Goblet Cells

Mucous secreting cells that secrete the viscous substance mucin. They also live in the small intestine, but are especially prevalent in the large intestine.

I DON'T
KNOW!!
JUST KEEP
RUNNING!!

SPLASH
SPLASH



AUGH!

CRACK



WHAT DO WE DO?!

SPLASH

GWAH ...

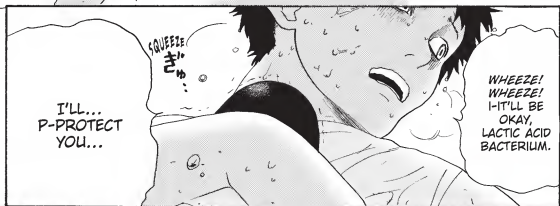
OH NO!

W-WE'RE SURROUNDED!

Lactic Acid Bacteria

Good bacteria that helps the health of the human body. They have a variety of specialties.

NYUUUU...



I'LL... P-PROTECT YOU...

SQUEEE
ぎゅ

WHEEZE!
WHEEZE!
I-IT'LL BE OKAY,
LACTIC ACID BACTERIUM.



NOW THAT'S FUNNY.

OH HO?

VERY FUNNY.

THIS CELL WANTS TO PROTECT THIS LACTIC ACID BACTERIUM.

Harmful Bacteria

Include pathogenic *Escherichia coli*, *Staphylococcus*, and *Clostridium*. They break down proteins and make harmful byproducts.

WHAT DO
YOU SAY
TO THIS?

SHOOM

LET'S
SEE YOU
TRY AND
PROTECT
IT.

GAAAGH!

NYUUU!!

THE TOXIN
ATTACK OF
A HARMFUL
BACTERIUM.

Effects of harmful bacteria

Examples of the damage done by harmful bacteria include intestinal putrefaction and the production of toxins and carcinogens. These can cause a variety of negative effects on the human body, such as drop in immune function, an unpleasant change in the smell of stools and gas, and diarrhea or constipation.

WE'RE
GOING TO
MAKE YOU
SUFFER IN
ALL SORTS
OF WAYS.

SO MAKE
SURE YOU
SCREAM
NICE AND
LOUD
FOR US.

GAH...

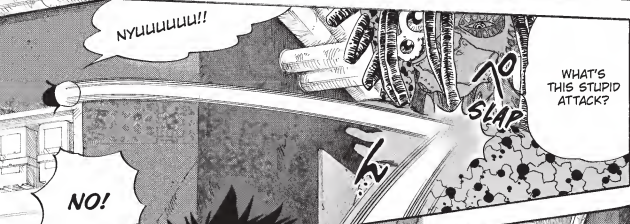
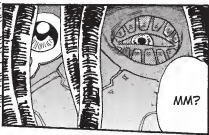
EH
HEH
HEH
HEH

WE'RE
COUNTING
ON YOU TO
ENTERTAIN
US, LITTLE
CELL.

WE CAME
ALL THE WAY TO
THE OTHER SIDE
OF THE INTESTINAL
WALLS, AND
WE'RE JUST
HEARTBROKEN
TO FIND WHAT A
BORING PLACE
IT IS.

AUGH!
MY
FEET!

NYUUUU!!





**RUN
SOMEWHERE
FAR AWAY!!**

NYU!

**GET
AWAY,
LACTIC
ACID
BACTERI-
UM!!**



NYU...
NYU.

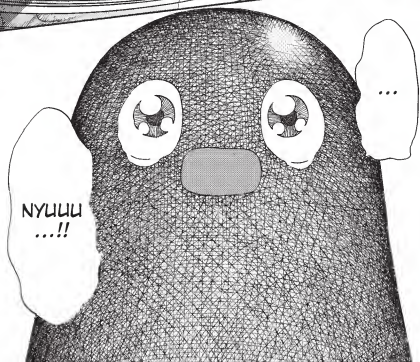
NYUUUU
NYUUUU!!
NYUUUU!!

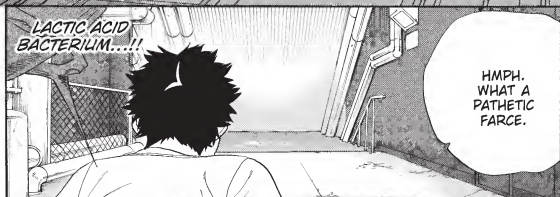
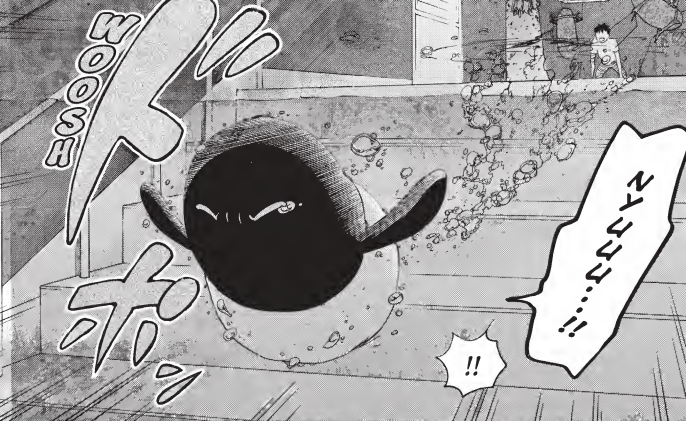
FLAP flap



**DON'T
WORRY
ABOUT
ME!**

**THINK OF
YOURSELF
AND RUN!!**







ARE YOU
READY?

MAYBE...

JUST
MAYBE...

CELL

L'Z'
O'Z'
M'Z'



FELT
JUST LIKE
THIS...
IN THE
END...

THE CELL
THAT
MADE ME...



MEMORY
TI!!

NK!!



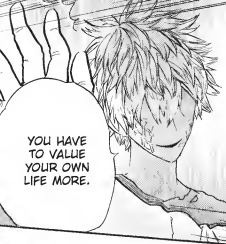
YAAAAAH!



GAH!

WHACK

G-
UGH!



YOU HAVE
TO VALUE
YOUR OWN
LIFE MORE.

YOU REALLY
SHOULDN'T MOVE
SO MUCH, WHITE
BLOOD CELL.
YOU'RE HURT.



ISN'T IT ME
YOU WANT
TO KILL?! IF
YOU WANT
PAYBACK, I'LL
FACE YOU!!

CANCER
CELL!
LET ME
OUT OF
HERE!!



...THEN I
CAN LET YOU
OUT RIGHT
AWAY.

IF
YOU CAN
ACCEPT
WHAT I
HAVE TO
TELL
YOU...



HOW TERRIBLE
YOU MUST
FEEL TO BE
TRAPPED THERE,
POWERLESS.

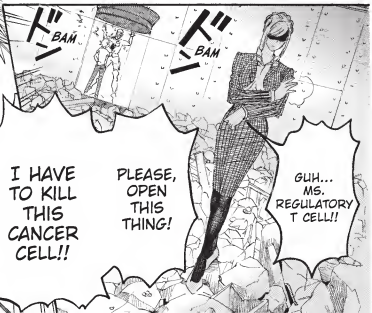
...?!



PLEASE!!

I HAVE
TO KILL
THIS
CANCER
CELL!!

PLEASE,
OPEN
THIS
THING!



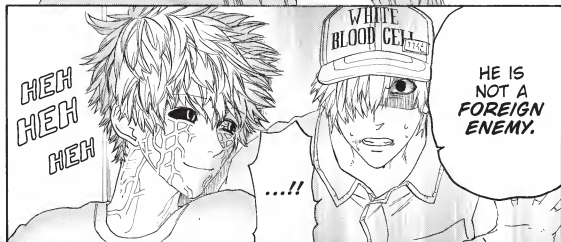
GUH...
MS.
REGULATORY
T CELL!!

The role of a regulatory T cell

Regulatory T cells have the ability to regulate the activity of immune cells so that they do not attack self cells or cells beneficial to the body. In this case, she is trying to suppress the attacks by the immune cells because the cancer cell is a self-borne cell and not considered a foreign substance (non-self).

KILL HIM?

IF THAT'S YOUR INTENT, THEN I CAN'T LET YOU OUT.





...WHITE
BLOOD
CELL...

...YOU
SPARED THAT
ORDINARY CELL
AND THOSE
LACTIC ACID
BACTERIA.

AND DESPITE
BEING SO
SERIOUS...



IT MADE
ME CHANGE
MY MIND
ABOUT SOME
THINGS.

NGH...



BUT IT
MADE ME
THINK.

YOU'RE
RIGHT.
I KNOW
THAT.

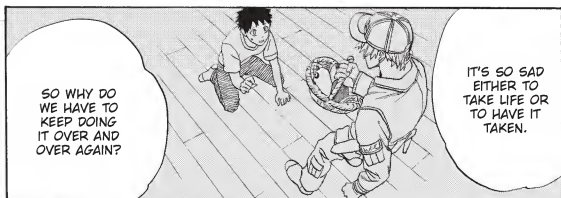
THAT WAS...
I DIDN'T KILL
THOSE BACTERIA
BECAUSE THEY
WERE BENEFICIAL
TO THIS BODY!!



WHY DOES
THAT
DISTINCTION
EXIST?

SOME
LIVES ARE
NECESSARY
...

...AND
OTHERS
AREN'T.



SO WHY DO
WE HAVE TO
KEEP DOING
IT OVER AND
OVER AGAIN?

IT'S SO SAD
EITHER TO
TAKE LIFE OR
TO HAVE IT
TAKEN.



IT'S
FOR THIS
BODY!! WE
DIE AND
WE KILL
BECAUSE
THAT'S
WHAT'S
NEEDED!!

WELL?
HAVE
YOU EVER
THOUGHT
ABOUT
SOMETHING
LIKE THIS?

HA HA. I
THOUGHT
YOU'D SAY
THAT.

SO LET'S
TAKE THIS
A LITTLE
FURTHER.



THE LIVES
OF TENS OF
TRILLIONS
OF CELLS, OR
THE SINGLE
LIFE OF THIS
BODY?

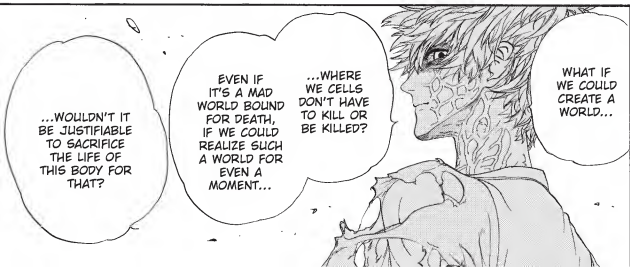
WHAT'S MORE
IMPORTANT...



I WAS
KILLED, AND
YOU DID THE
KILLING...
WE'VE ALL
SUFFERED.

SACRIFICING
OURSELVES
SO THAT
THIS BODY
CAN KEEP ON
LIVING.

WE CELLS HAVE
KILLED, BEEN
KILLED, HATED
EACH OTHER—



...WOULDN'T IT
BE JUSTIFIABLE
TO SACRIFICE
THE LIFE OF
THIS BODY FOR
THAT?

EVEN IF
IT'S A MAD
WORLD BOUND
FOR DEATH,
IF WE COULD
REALIZE SUCH
A WORLD FOR
EVEN A
MOMENT...

...WHERE
WE CELLS
DON'T HAVE
TO KILL OR
BE KILLED?

WHAT IF
WE COULD
CREATE A
WORLD...



LET ME OUT,
CANCER CELL!
I'M GOING TO
KILL YOU!!
I'M GOING TO
FIX YOUR
ENORMOUS
MISTAKE!!

MY
JOB IS
TO MAKE
THAT
INTO A
REALITY.
THERE'S
NOTHING
MISTAKEN
ABOUT
IT.

WE'LL DIE.
BUT WE'LL
DIE FREE.

IF THIS
BODY DIES,
THAT MEANS
THAT ALL
OF US
CELLS WILL
DIE!!



I
CAN.

DO YOU
REALLY
THINK YOU
COULD DO
SUCH A—

MS.
REGULATORY
T CELL IS ON
MY SIDE...

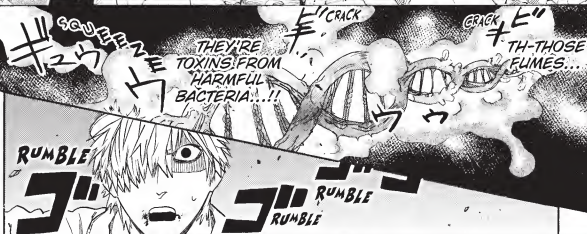
AND
SO IS—



NEVER!!

I'LL
NEVER LET
YOU
DO THAT!!

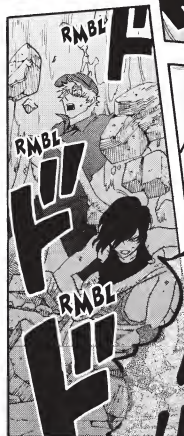
THIS...
PLACE!!



WHITE
BLOOD CELL,
MY KIND-
HEARTED
KILLER.

WHEN
THE NEW
WORLD IS
FINISHED...

...CAN
WE BE
FRIENDS?





**CANCER
CELL, DON'T
DO THIS!!!**

RUMBLE

RUMBLE

CHAPTER 24: END

Cells at
Work!
はたらく細胞



Cancer Cells

Cells that multiply uncontrollably due to a genetic anomaly. They overstep the boundaries with neighboring normal cells.

CHAPTER 25: CANCER CELL II (PART II)



ARE
YOU ALL
RIGHT?!

NK!!
MEMORY
T!! MS.
REGULA-
TORY T
CELL!!

White Blood Cell (Neutrophil)

Destroys foreign substances that enter the body from the outside, such as bacteria and viruses.



Memory T Cell

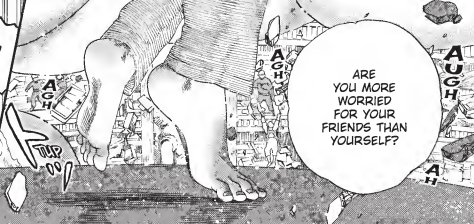
Some Killer T cells become Memory T cells, and prepare to attack in case the same enemy appears again.



NK Cell (Natural Killer Cell)

Patrols the whole body and attacks cancerous and virus infected cells on sight.

NNH...

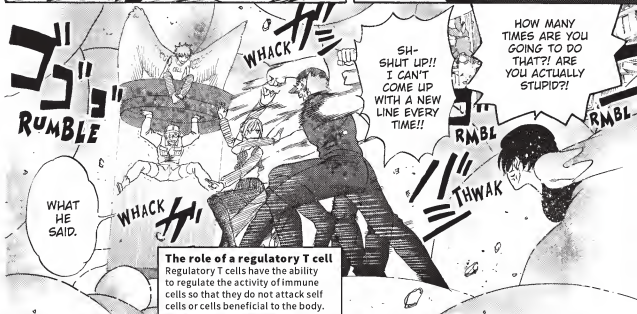


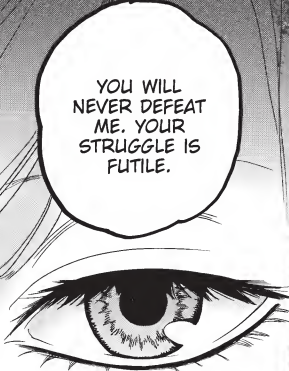
...ALL
OF YOUR
MOVES,
YOU
LITTLE
BRAT!!

I
ALREADY
KNOW...



Regulatory T Cell
She regulates the activity of
T cells to prevent immune
system anomalies.





YOU WILL
NEVER DEFEAT
ME. YOUR
STRUGGLE IS
FUTILE.

GIVE UP
AND CEASE
YOUR
ATTACKS.



CATCH

YES... YOU'VE
ALWAYS BEEN
THE SAME.



GUH...

SQUEEZE
" < "



BAD AT
STRATEGY...
AND SWAYED
BY EMOTION.

UNABLE
TO FEED OFF OF
VICTORY, NOR
TO RISE ABOVE
DEFEAT. YOU'VE
ALWAYS BEEN
LIKE THAT.

NOOOO,

WHATEVER
SHALL WE
DO WITH
YOU?

LOOM

ズ

ズ

ズ

WE JUST
CAN'T DECIDE
WHERE TO
START
SLICING
YOU.

Harmful Bacteria

include pathogenic *Escherichia coli*,
Staphylococcus, and *Clostridium*.
They break down proteins and
make harmful byproduct.

WOOOOW!

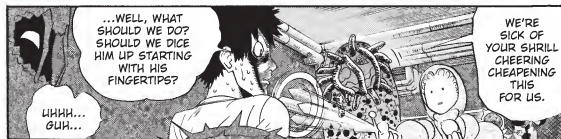
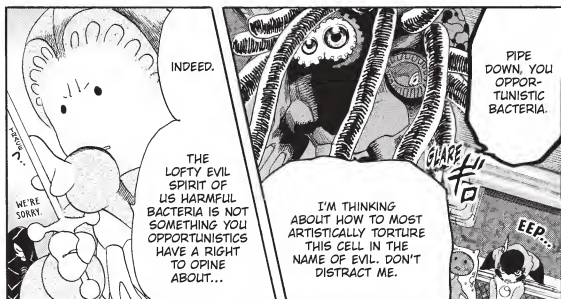
Opportunistic Bacteria

include *Bacteroides*, nonpathogenic
Escherichia coli, and *Eubacterium*. Neither
helping nor harming the body, they make up
roughly 70% of the bacteria in the intestines.

HOW ABOUT
YOU USE YOUR
TENTACLES
TO SLAM HIM
AGAINST THE
WALL?!

WOOOW!♡
YOU HARMFUL
BACTERIA ARE
PROS OF EVIL
ENTERTAIN-
MENT!♡

I'M SO
IMPRESSED!!
TO LET HIM
KNOW EXACTLY
WHAT YOU'RE
GOING TO DO
TO HIM—
HOW TERRIBLY
CRUEL
OF YOU!!



A black and white manga panel. In the center, a character wearing a cap with 'WHOLE BLOOD CEMENT' on it is holding a large, dark, spiky sphere. To the right, another character is lying on the ground, looking up in shock. A large speech bubble on the right contains the sound effect 'GAAAUGH!!!'. On the left, large stylized sound effects 'サバ' and 'スプラッシュ' are written, with 'アア' at the bottom. The background shows a wooden structure and some foliage.

STEP 7:



SORRY TO KEEP YOU WAITING, CELL BOY!!

STEP 7:



SORRY TO KEEP YOU WAITING, CELL BOY!!

W-WHITE BLOOD CELLS!!

KITCH

TSK.

W-WHITE BLOOD CELLS!!

KITCH

TSK.

W-WHITE BLOOD CELLS!!

KITCH

TSK.





YOU'VE GOT
SOME NERVE
CAUSING
TROUBLE IN
THE BIGGEST
IMMUNE
TISSUE IN THE
BODY!!

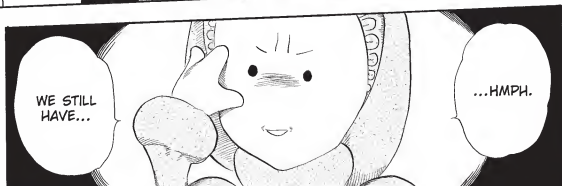
TIME
FOR YOUR
PUNISHMENT,
GERMS!!



GAH
QUIT YOUR
UNSEEMLY
WAILING!

TAKE
THIS!

WHAT DO
WE DO,
MR.
HARMFUL?



WE STILL
HAVE...

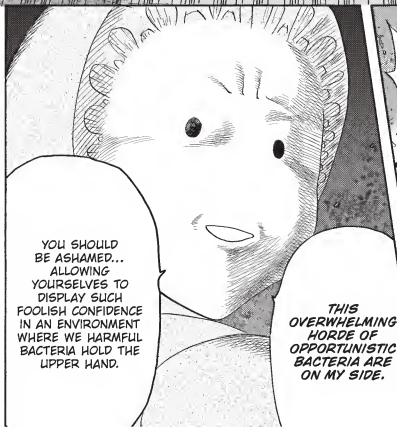
...HMPH.



...THE
ADVANTAGE IN
NUMBERS.

RUMBLE
RUMBLE

RUMBLE
RUMBLE



YOU SHOULD
BE ASHAMED...
ALLOWING
YOURSELVES TO
DISPLAY SUCH
FOOLISH CONFIDENCE
IN AN ENVIRONMENT
WHERE WE HARMFUL
BACTERIA HOLD THE
UPPER HAND.

THIS
OVERWHELMING
HORDE OF
OPPORTUNISTIC
BACTERIA ARE
ON MY SIDE.



WHAT?!
THERE'S
SO MANY
MORE OF
THEM!!

ガラ
CRUMBLE
CRUMBLE

ガラ
CRUMBLE
CRUMBLE

EEP...

VICTORY
ACHIEVED
WITH
NUMBERS
IS THE
HIGHEST
AESTHETIC
FOR US
BACTERIA!!
BWAA
HA HA!

NUMBERS!!
THAT'S
POWER!!

BOOM BOOM

BOOM

HA...
HA...

BOOM

BOOM

HUH
...?

BOOM

BOOM

BOOM



NYU

BOMPF

WAH! BOMPF

EKK!

BOMPF

WHACK WHACK

BOMPF

BOMPF

BOMPF

BOMPF

RUMBLE

BOMPF

A-ARE THESE GOOD BACTERIA?!

Good Bacteria
include lactic acid bacteria, *L. gasseri* and *Bifidobacterium*. They can help strengthen immune response and promote intestinal activity. They act in ways that are beneficial to the human body.

OPPOR-
TUNISTIC
BACTERIA...
WHAT ARE
YOU DOING?!
GET RID OF
THEM...!

GUUUUGH...
IT ONLY TOOK
THIS MANY GOOD
BACTERIA TO
COMPLETELY
FLIP THE
SITUATION?

**Characteristic of
Opportunistic Bacteria**
They side with good or
harmful bacteria, depending
on who holds the advantage.

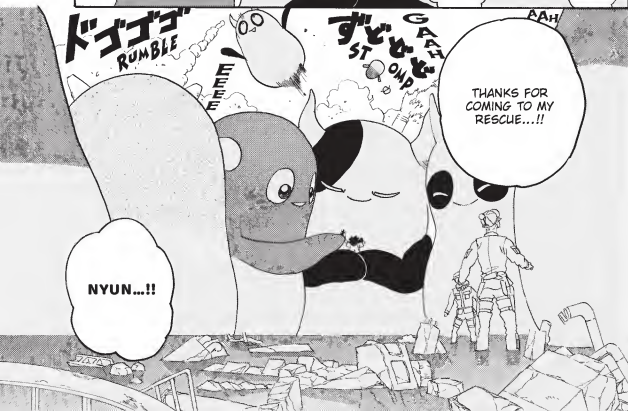
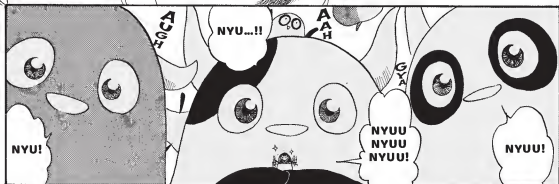
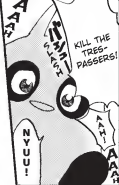
THAT'S RIGHT!
COULDN'T YOU
JUST TAKE A
COMPLIMENT INSTEAD
OF BLABBERING ON
ABOUT ART? HOW
HIGH-MAINTENANCE
ARE YOU?

IT'S THE
AGE OF GOOD
BACTERIA NOW!!
IT'S TIME FOR
US TO JOIN
THE RANKS
OF BEAUTIFUL,
UPSTANDING
CITIZEN
BACTERIA!!

QUIT YOUR
YAPPING!!
THE TIMES
HAVE
CHANGED!!

WE'RE GONNA
KILL YOU,
OBVIOUSLY.

LET'S ALL BE
FRIENDS NOW,
EVERYONE.♡



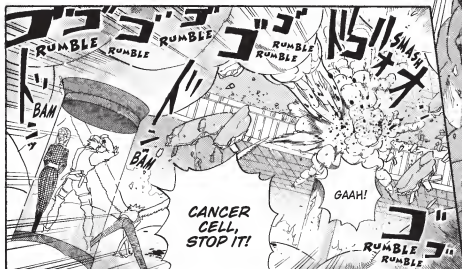


I WON'T
KILL
THEM
YET.

DON'T
WORRY.



MEMORY
T!! NK!!



CANCER
CELL,
STOP IT!

GAAH!



NO.

I DON'T
WANT TO
KILL A
FRIEND.

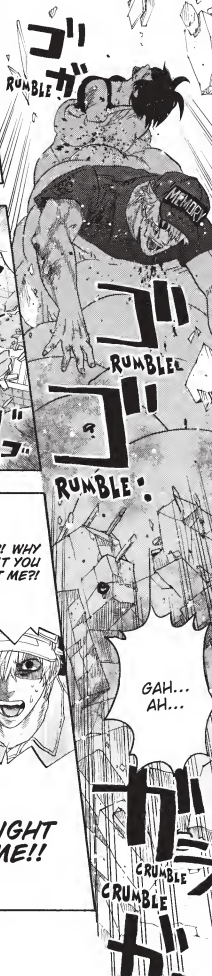
YOU'RE
JUST LIKE ME,
STRUGGLING
WITHIN A FATE
THAT WAS
DECIDED FOR
YOU!

BECAUSE I
LIKE YOUR
CONTRADICTIONS.



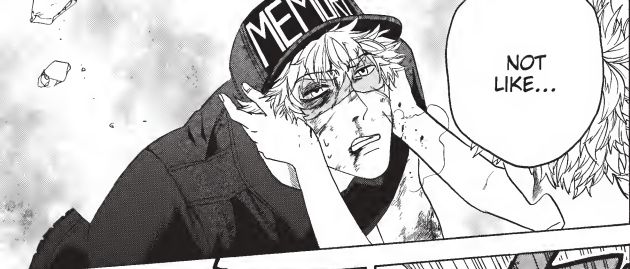
WHY?! WHY
WON'T YOU
FIGHT ME?!

FIGHT
ME!!



GAAH...
AH...

CRUMBLE
CRUMBLE



ゴ "ゴ" ゴ

RUMBLE RUMBLE RUMBLE

I HATE MEMORY T'S AND NK'S GUTS. I WANT TO SMASH EVERYTHING THAT'S DEAR TO THEM.

I LIKE WHITE BLOOD CELL! THERE'S SO MUCH I WANT TO TALK WITH HIM ABOUT.

CELL

ゴ "ゴ" ゴ

RUMBLE RUMBLE RUMBLE

I HATE MEMORY T'S AND NK'S GUTS. I WANT TO SMASH EVERYTHING THAT'S DEAR TO THEM.

I LIKE WHITE BLOOD CELL! THERE'S SO MUCH I WANT TO TALK WITH HIM ABOUT.

CELL

I THINK I CAN GAIN THE POWER EARLIER THAN I THOUGHT.

RUMBLE
RUMBLE
RUMBLE
RUMBLE

THOSE EMOTIONS ARE GIVING ME STRENGTH.

A black and white manga panel depicting a dramatic moment. A character, likely the protagonist, is shown from the chest up, wearing a dark jacket with a light-colored collar. They are being hoisted or supported by a large, mechanical arm or claw that descends from above. The background consists of large, billowing clouds and a complex network of structural beams or cables, suggesting an industrial or aerial setting. The character's face shows determination and focus. There are two speech bubbles containing Japanese text.

Speech Bubble 1 (Left):

「今から
早くに
力になれる。」

Speech Bubble 2 (Right):

感情が
私を
強くする。

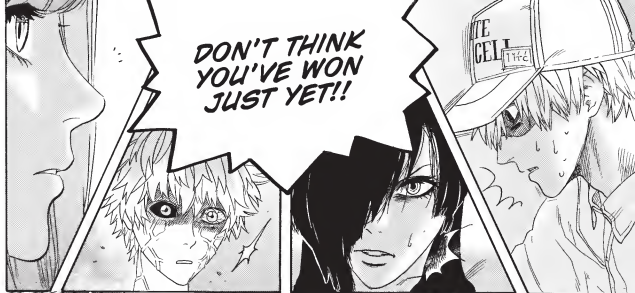
DIVIDE JUST
30 TIMES AND
THERE'LL BE
MORE THAN A
BILLION OF MY
FRIENDS!!

A SINGLE
DIVISION TO
DOUBLE...
DIVIDE AGAIN
TO DOUBLE
AGAIN!



...IF YOU
THINK YOU
CAN STOP
ME, GO
AHEAD AND
TRY.

ALL RIGHT,
YOU HARD-
WORKING
IMMUNE
CELLS...

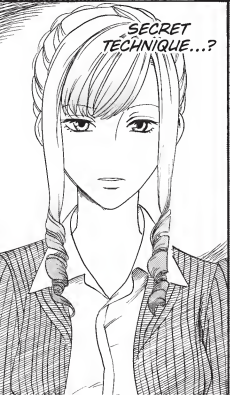




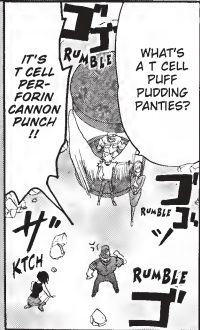
PERFORIN
CANNON
PUNCH!!

T CELL
ULTIMATE
SECRET
TECHNIQUE!

BOOM



SECRET
TECHNIQUE...?



IT'S
T CELL
PER-
FORIN
CANNON
PUNCH
!!

WHAT'S
A T CELL
PUFF
PUDDING
PANTIES?



T CELL!
PERF...
WHAT?

...?



T...
WHAT?

...?

THYMUS

HEY MAN,
YOU'RE
SOMETHING
ELSE.

I JUST
GOT
LUCKY
THAT
TIME.

BUT
I'LL WORK
HARD AND
BUILD UP
THE SKILLS
I NEED...

A CELL OF YOUR
TALENTS MIGHT
BE ABLE TO
MASTER THE
ULTIMATE SECRET
TECHNIQUE!

Thymus
A lymphoid organ that
differentiates and
matures precursor T cells
into full-fledged T cells.

UO
TWITCH

ULTIMATE...
SECRET
TECHNIQUE?

IT'S SO AMAZING
AND POWERFUL
THAT THE TARGET
IS BLOWN AWAY
AS IF STRUCK BY
A GIANT FIST.

IT'S CALLED
T-CELL
PERFORIN
CANNON
PUNCH!!

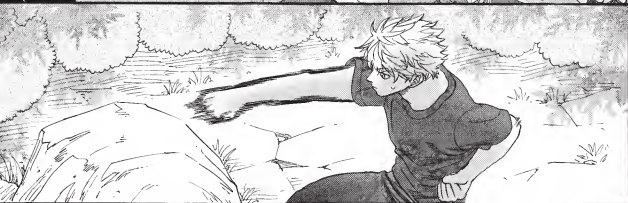
IT'S A LEGENDARY
MOVE THAT CAN
ONLY BE UNLEASHED
WHEN A T CELL'S
DESIRE TO PROTECT
THE BODY IS
HEIGHTENED TO ITS
LIMITS.

Perforin

A chemical released by Killer T cells
when they attack infected cells.

DESIRE...
GIANT
FIST...?

ULTIMATE
SECRET
TECHNIQUE...



I'M
DONE
LETTING
YOU
HAVE
YOUR
WAY!

MEMORY

MEMOR

TAKE THIS!
T CELL
PERFORIN
CANNON
PULUNCH!!



WHAT
HAPPENED
TO SUP-
PRESSING
THEIR
ATTACKS
AGAINST
ME?!
WHY DID
YOU JUST
DODGE?!

MS.
REGULATORY—
MS.
REGULATORY
T CELL?!

HACK HACK!
WH-WH-WH-WH-
WHAT...WAS THAT
WEIRD MOVE?

...?!

...HAVE
MADE AN
ERROR OF
JUDGMENT.

I
SEEM
TO...

...YOU
ARE...

UPON
CLOSER
INSPEC-
TION...

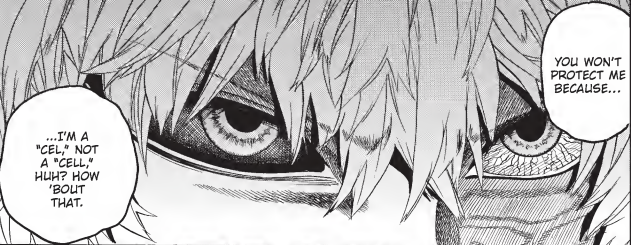
YOU WERE
NOT A
CELL TO BE
PROTECTED.

1020
TWITCH

REALLY
?!!

BOOM

YOU
TURNED
OUT NOT
TO BE A
CELL,
BUT A
"CEL"...



...I'M A
"CEL," NOT
A "CELL." HOW
'BOUT
THAT.

YOU WON'T
PROTECT ME
BECAUSE...



THAT'S
FINE...

WELL,
THAT'S FINE
WITH ME, IF
THAT'S YOUR
DECISION.

SO...
YOU'RE NOT
ON MY SIDE
ANYMORE.

THAT'S
RIGHT.

BUT...



I'LL NEED
YOU TO
STAY OUT OF
MY WAY.



SLASH

LIKE I SAID...

...I KNOW
ALL YOUR
MOVES
ALREADY.

NAILED
IT!

GRIP



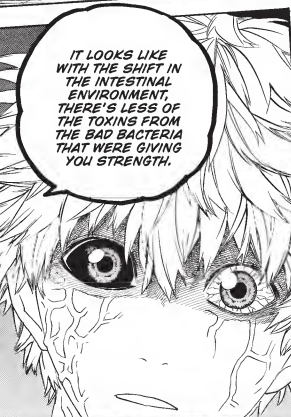
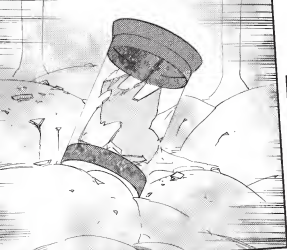
CRUMBLE

ヒキ
SNAP

...CUTTING
ME DOESN'T
DO
ANYTHING.
AND
LIKE I
SAID...

ヒキ
SNAP

SNAP



IT LOOKS LIKE
WITH THE SHIFT IN
THE INTESTINAL
ENVIRONMENT,
THERE'S LESS OF
THE TOXINS FROM
THE BAD BACTERIA
THAT WERE GIVING
YOU STRENGTH.



ハ?
WHEEEZ
I CAN'T
MAINTAIN MY
STRENGTH?!

WHEEEZ
I CAN'T
CONCENTRATE MY
POWER?!
WHY...?!

!!



ゴ
RUMBLE
ゴ
ゴ

RUMBLE

ゴ
ゴ

CRUMBLE
ボロ
ボロ

MY
WINGS
!!

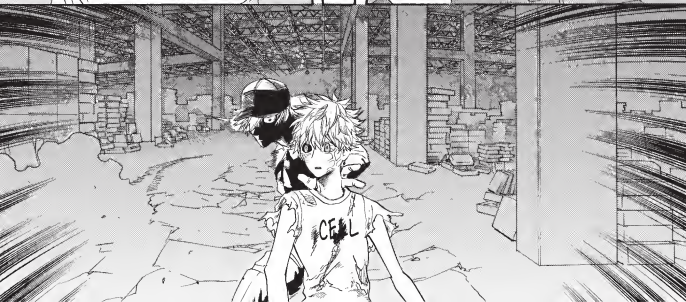
CRUMBLE

ボロ
ボロ

ゴ
ゴ

RUMBLE

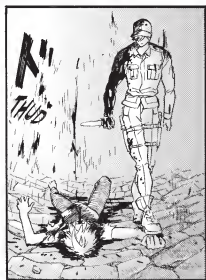
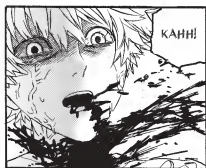
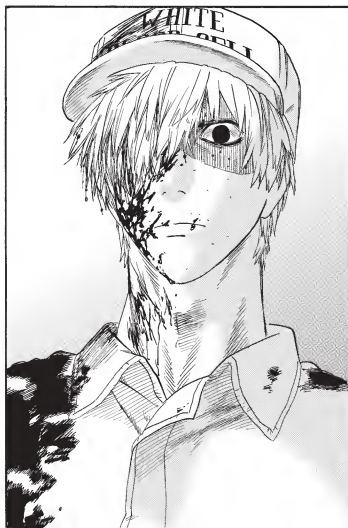
W-
WHY...?

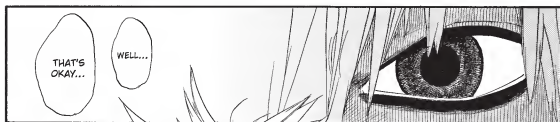




SLASH

WHITE
BLOOD
C-1





...MY KIND-
HEARTED
KILLER.

SEE YOU
AGAIN...
WHITE
BLOOD
CELL...



UH-HUH.

I REALLY
DID IT...

CANCER
CELL HAS
BEEN
DEFEATED!!

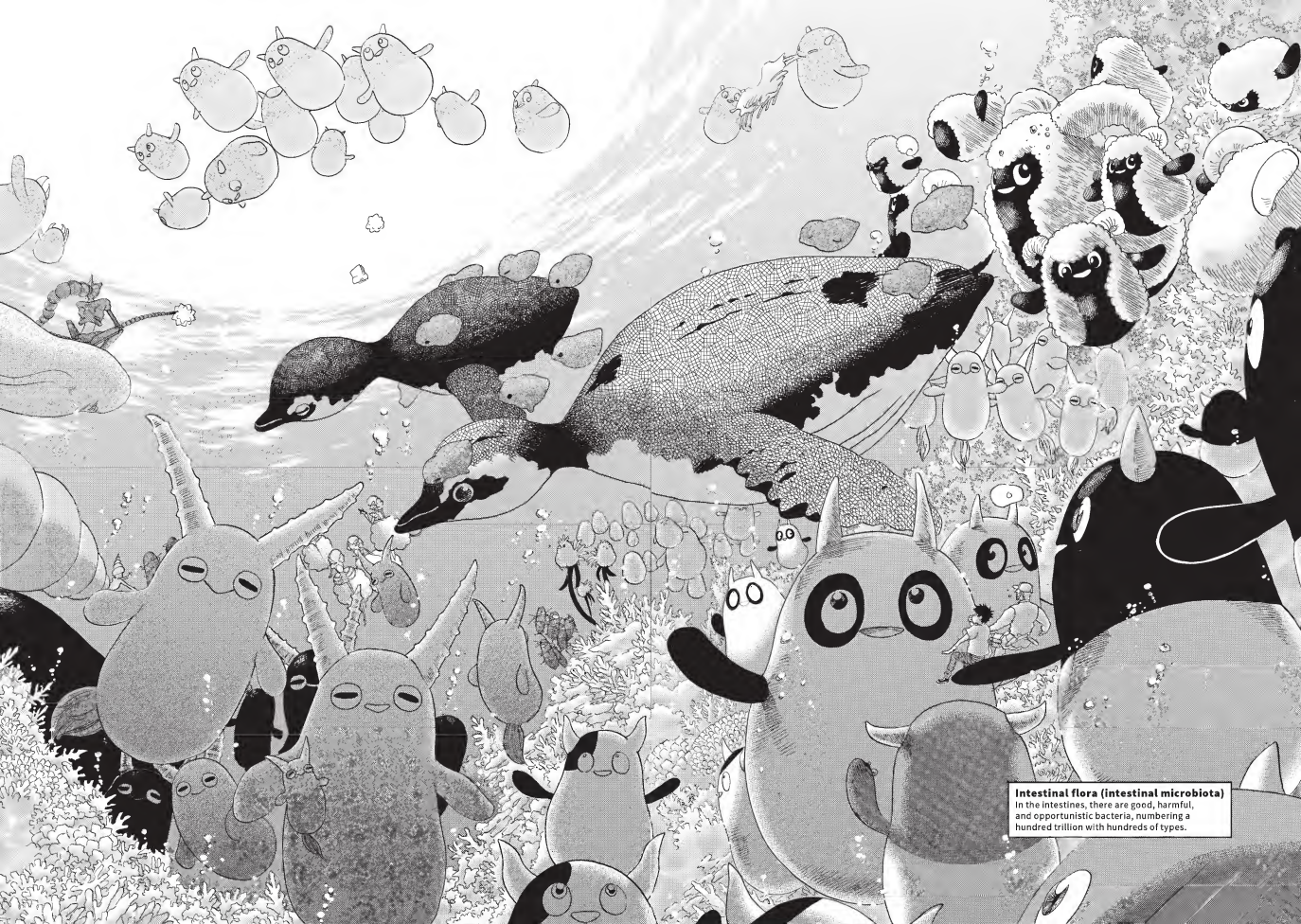
THE
CRISIS
IS
OVER!!



Role of lactic acid bacteria

Some lactic acid bacteria are thought to interact directly with the intestinal wall to help maintain the functions of the intestinal barrier.



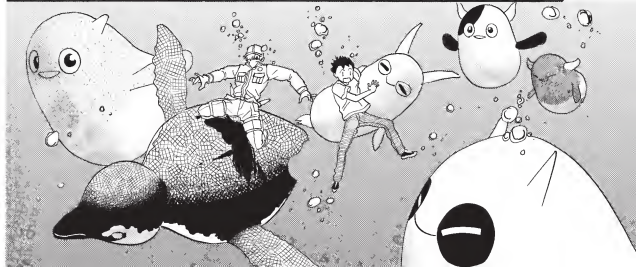
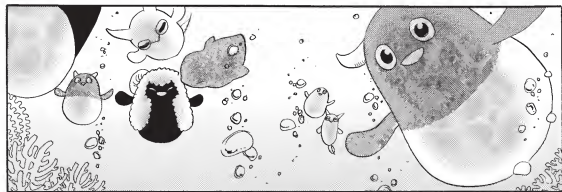
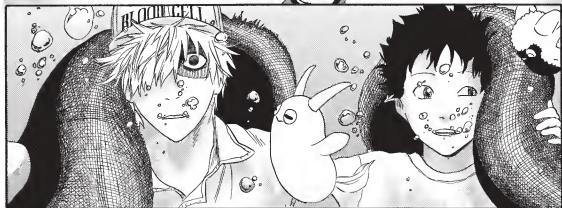


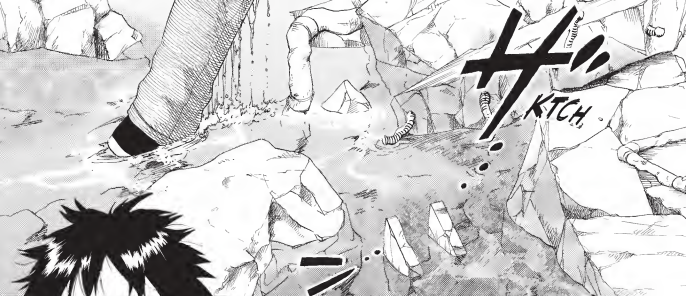
Intestinal flora (intestinal microbiota)

In the intestines, there are good, harmful, and opportunistic bacteria, numbering a hundred trillion with hundreds of types.

THIS IS
THE WORLD
WHERE YOU
LIVE....!!

I SEE
NOW...
THIS...







**T CELL
ULTIMATE
SECRET
TECHNIQUE:
PERFORIN
CANNON
PUNCH
!!!**

NOW, LOOK
CAREFULLY,
NAIVE T
CELLS!! JUST
THEN, MY FIST
WENT LIKE
THIS—

WHOOSH

JUST
LOOKS LIKE
A NORMAL
PUNCH TO
ME...

YUP...



CELLS AT WORK! VOLUME 5: END

Medical Editor: Tomoyuki Harada

Cells at
Work!
はたSC細胞



"An emotional and artistic tour de force! We see incredible triumph, and crushing defeat... each panel [is] a thrill!"
—Anitay

"A journey that's instantly compelling."
—Anime News Network

WELCOME TO THE BALLROOM

By Tomo Takeuchi

Feckless high school student Tatara Fujita wants to be good at something—anything. Unfortunately, he's about as average as a slouchy teen can be. The local bullies know this, and make it a habit to hit him up for cash, but all that changes when the debonair Kaname Sengoku sends them packing. Sengoku's not the neighborhood watch, though. He's a professional ballroom dancer. And once Tatara Fujita gets pulled into the world of ballroom, his life will never be the same.





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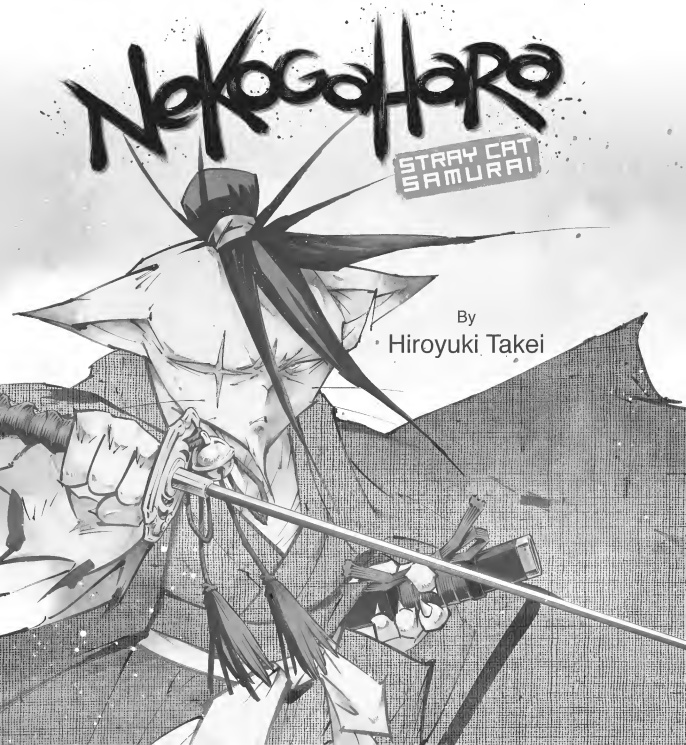
*New action series from Hiroyuki Takei, creator of
the classic shonen franchise Shaman King!*

In medieval Japan, a bell hanging on the collar is a sign that a cat has a master. Norachiyo's bell hangs from his katana sheath, but he is nonetheless a stray — a ronin. This one-eyed cat samurai travels across a dishonest world, cutting through pretense and deception with his blade.

NekoGallaro

STRAY CAT
SAMURAI

By
Hiroyuki Takei



Japan's most
powerful spirit
medium delves
into the ghost
world's greatest
mysteries!

Story by Kyo
Shirodaira, famed
author of mystery
fiction and creator of
Spiral, *Blast of Tempest*,
and *The Record of a
Fallen Vampire*.



Both touched by spirits called yōkai, Kotoko and Kurō have gained unique superhuman powers. But to gain her powers Kotoko has given up an eye and a leg, and Kurō's personal life is in shambles. So when Kotoko suggests they team up to deal with renegades from the spirit world, Kurō doesn't have many other choices, but Kotoko might just have a few ulterior motives...

IN/SPECTRE

STORY BY KYO SHIRODAIRA
ART BY CHASHIBA KATASE

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H A P P I N E S S

——ハピネス——

By Shuzo Oshimi

From the creator of *The Flowers of Evil*

Nothing interesting is happening in Makoto Ozaki's first year of high school. His life is a series of quiet humiliations: low-grade bullies, unreliable friends, and the constant frustration of his adolescent lust. But one night, a pale, thin girl knocks him to the ground in an alley and offers him a choice. Now everything is different. Daylight is searingly bright. Food tastes awful. And worse than anything is the terrible, consuming thirst...

Praise for Shuzo Oshimi's *The Flowers of Evil*

"A shockingly readable story that vividly—one might even say queasily—evokes the fear and confusion of discovering one's own sexuality. Recommended." —The Manga Critic

"A page-turning tale of sordid middle school blackmail." —Otaku USA Magazine

"A stunning new horror manga." —Third Eye Comics



KC
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COMICS

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The Black Museum ^{The} Ghost and the Lady

By Kazuhiro Fujita

Deep in Scotland Yard in London sits an evidence room dedicated to the greatest mysteries of British history. In this “Black Museum” sits a misshapen hunk of lead—two bullets fused together—the key to a wartime encounter between Florence Nightingale, the mother of modern nursing, and a supernatural Man in Grey. This story is unknown to most scholars of history, but a special guest of the museum will tell the tale of The Ghost and the Lady...

Praise for Kazuhiro Fujita’s *Ushio and Tora*

“A charming revival that combines a classic look with modern depth and pacing... **Essential viewing both for curmudgeons and new fans alike.**” — Anime News Network

“**GREAT!** The first episode of *Ushio and Tora* captures the essence of '90s anime.” — IGN

A new series from the creator of *Soul Eater*, the megahit manga and anime seen on Toonami!

"Fun and lively... a great start!"

-Adventures in Poor Taste

FIRE FORCE

By Atsushi Ohkubo

The city of Tokyo is plagued by a deadly phenomenon: spontaneous human combustion! Luckily, a special team is there to quench the inferno: The Fire Force! The fire soldiers at Special Fire Cathedral 8 are about to get a unique addition. Enter Shinra, a boy who possesses the power to run at the speed of a rocket, leaving behind the famous "devil's footprints" (and destroying his shoes in the process). Can Shinra and his colleagues discover the source of this strange epidemic before the city burns to ashes?

Cells at Work! 5

KODANSHA COMICS Digital Edition

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